Growing Pains

THE present economic situation in the pulp and paper making industry came in for scrutiny and analysis in several of the addresses made before the eighteenth annual convention of the American Pulp and Paper Mill Superintendents Association held recently at Springfield, Mass., and reported elsewhere in this issue of *The Paper Industry*. Comments made by three of the speakers were particularly thought provoking in this respect.

One of these speakers, Charles W. Boyce, Secretary of the American Paper and Pulp Association, expressed the opinion that forward progress in the industry will be more difficult to achieve as time goes on and suggested that the industry's mettle would soon be tested by the great expansion movement now under way in the South. He also referred to the general installation of the fourdrinier machines in the mills that are going up in the South for the production of board and intimated that these machines, as far as operation is concerned, may be shifted from board to paper without much difficulty.

Should the expansion program proceed at a more rapid rate than increase in consumption of the grades for which the mills are being built, it is but logical to assume some shifting to other grades. The effect of such possible shifting, however, cannot be prognosticated accurately, as there would be numerous variables that would influence it.

Dr. J. P. Hagenauer, a second speaker and an associate of Mr. Boyce, remarked that the industry has reached a period in its development when increased profits can only be realized through increased efficiency of operation. He likewise expressed the opinion that the day of high prices with resulting high profits is gone.

The third speaker, George R. Wallace, President of the Fitchburg Paper Company, reflected that one's attitude toward the paper industry is not the same every day in the year; that today he likes the paper business; and then recalled the trying times of a few years ago when prices were on the decline and manufacturers were in the price cutting business—reason a plenty at the time for an attitude different from the present optimistic one. He related how the industry once more returned to profit making through the cooperative efforts of its executive leaders; recalled the need for departments of production and technology to pull together for the good of the industry; and stressed the need for spending money to keep plants in shape to meet competition. Too tight a purse string on capital investment, insofar as modern machinery is concerned, said Mr. Wallace, means eventual shutting down for the last time without even the need to wash up. He likewise prophesied that the industry is entering an era of greater demand for paper of all grades than ever before experienced and suggested that individual imagination plus experience be put to the challenge it presents.

+ EDITORIAL +

Develop Your Sense of Observation

EVERY plant man should cultivate the sense of observation for it is in a great measure the means by which he may learn and so add to his store of knowledge upon which can be built a successful career. A casual glance cannot be made to take the place of true observation, that is to say, it is not sufficiently thorough to give such information as would be required for an analysis of the condition in mind.

To the man who is alert, it is not enough for him to see that a pipe is being laid in a trench. He wants to know what the pipe will be used for. He will move up closer to the workmen and ask questions and make mental notes of the work going on so that his information will be of use in the solution of future problems.

This does not mean that the job you may contemplate must be performed just like one observed at some time in the past; it means rather that the previous job should form the basis of further investigation and analysis so that the new work will be constructed in the most approved manner possible.

This sense of keen observation has been developed to a marked degree by the executive who will walk through a plant and point out conditions which may have been entirely overlooked by the men who are directly associated with the plant day in and day out. In all probability the executive was not born with this sense, but he has developed the habit of not only seeing things but of thinking of them at the same time.

To the young man just getting a start in pulp and papermaking, there is no better suggestion to be offered than that he observe, and that he study and analyze what he has seen. It will also pay some of the older men in the industry to take a personal inventory of themselves on this score.

Prepare for Winter

DO YOU recall some of the operating difficulties that were experienced in your mill last winter that you decided to correct before winter came again? It may be that you do recall them and that you have already seen to it that these difficulties have been remedied. Yet it is human nature to procrastinate and even to forget.

If you have done all of the work about the mill that you planned for the summer, consider yourself one of the fortunate and give no further thought to it. On the other hand, if you know of some operating difficulty or difficulties of the past winter that hasn't or haven't been corrected, delay no further in seeing that the necessary work is done just as quickly as possible.

Then, of course, the suggestion might be made to go over all equipment that is unprotected from the weather. Check it carefully to ascertain whether it is in relatively good condition and in position to stand up against the added strain of winter operation.

Likewise, go over all of the buildings from roofs to basements. Do not overlook any condition that might possibly cause trouble before the next winter season is over. There should be no hesitation about fixing something that you have the feeling may only possibly get by. Such a practice is always economy in the long run.

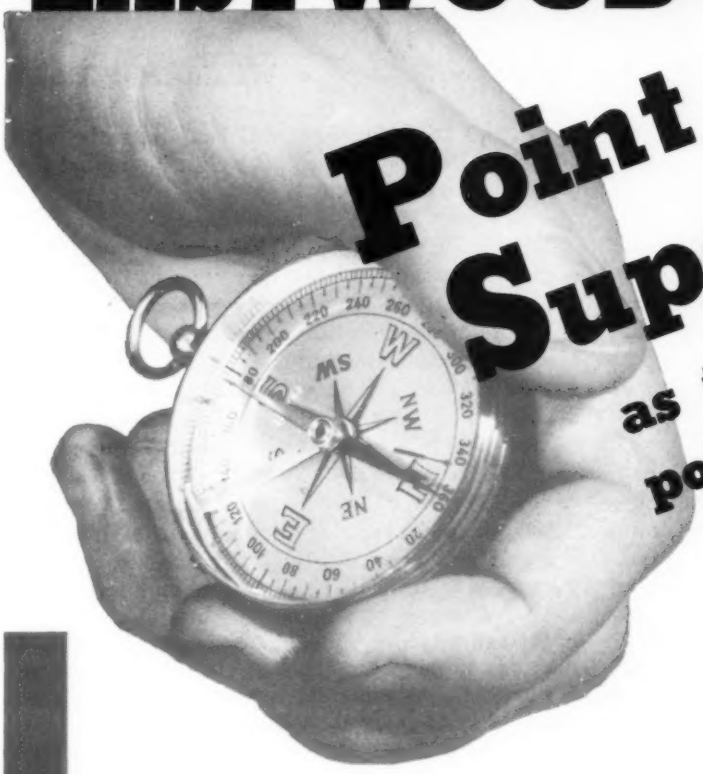
Not even the mill interior should escape the scrutiny of a careful inspection. There are numerous jobs within a mill just as without which have to be done from time to time and which can be done during the summer months better than during the winter.

With such maintenance work out of the way, you can enter the winter season in so far as mill operation is concerned with the same freedom of mind that the driver of an automobile has when a new set of tires are placed on his machine or when the car has been inspected and put in first class condition by an expert mechanic.

Protect the Eyes

THERE is little or no demand for the services of workers without eyes. No more terrible catastrophe can be imagined than the moment following the realization that the bodily functions are perfect, except that light has left the eyes. The safety engineer and those especially interested in preventing industrial accidents feel disheartened many times at the risks men take with the precious sense of sight. Protective devices are not always used. It is said that nearly 40 per cent of all compensation awards relate to eye injuries.

EASTWOOD WIRES



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More Random Thoughts

WILLIAM SIBLEY

◆IN A RECENT ISSUE of *Business Week* there is a little comment to the effect that whiskey distillers are beginning to cut down their output since it is becoming apparent that stocks are reaching adequate proportions to supply current demand. "And this summer," runs the article, "shutdowns among distillers are expected to be more extensive than was customary in pre-prohibition days." Maybe so. But probably not. The soundest of authorities know that many of the distillers are producing a volume of whiskey far in excess of all possible demand and that they are continuing to pile up stocks in anticipation of the inevitable return of some form of prohibition. It is far-sightedness on their part to do just this. Should their judgment be in error regarding the coming of prohibition, then they may capitalize their investment through the ageing of their product. And if it does come, which many of them confidently expect, they will be in a position to supply "bootleg" for years to come.

The prohibition forces are smarter than they used to be. They are doing some very intelligent work and only now are they beginning to come out into the open. One porcelain enameled sign manufacturer in Chicago is now working on an order for 1,000 signs to be placed along the highways throughout Illinois —those signs to carry dry propaganda and to be paid for by the W. C. T. U. At the same time, the dry forces are starting to advertise; they are working tooth and nail to force Congress to pass a law prohibiting the advertising of all alcoholic beverages. And if they can do that, goodnight to much of the industry.

The trouble is the distillers very largely bring about their own troubles. They were the chief factor for the institution of prohibition in 1918 and they are again their own worst enemies. There is small difference between the "saloon" of yesterday and the "tavern" of today save the recently developed neon lights and modernistic furniture. And the institution of the afternoon "cocktail hour," the advertising of whiskey to beautifully gowned women, the making of whiskey-drinking the "smart" thing to do—such institutions must, by their own force, become boomerangs. False advertising of whiskey is another vicious practice which is reacting detrimentally to the whiskey industry. I picked up a pint bottle of whiskey from a display not long ago, the front label of which assured me that "the youngest whiskey in this bottle is 12 years old." The inference was that here was an exceptionally good whiskey. But the back label, in very fine print, told me that this was a blend of 12 year old whiskey and neutral spirits—and that the whiskey content was 20 per cent of the bulk of the pint. So, in reality, "the youngest whiskey" was the *only* whiskey. Eventually one's lies, even inferential lies, will catch up with one.

◆TURN THE FOLLOWING over to your house-organ editor and let him make copy of it, for here are a few facts the average worker doesn't know.

In 1914, the average worker couldn't afford an automobile because it took all the wages of 1¼ years to pay for it. Today he may have an automobile for an average of 22 weeks salary. During 1914, the shoes he wore cost him 9 hours and 20 minutes work; today only 3 hours and 50 minutes labor. A ton of coal used to cost 32½ hours of labor; today it costs 21½ hours. Although food prices have gone up sharply during the past year or so, a pound of round steak cost 56 minutes of labor in 1914 and only 34 minutes of labor today. The cost of a pound of butter has similarly been reduced, in point of labor involved, from 1½ hours to 40 minutes. A pound of coffee used to cost 1 hour and 10 minutes, whereas today the labor involved is no more than 25 minutes.

Furniture, rugs, draperies, and other household goods have also risen in price during the past few years. Sharply so. But to buy a three-piece bedroom suite meant at least 105 hours of labor, whereas the same style of furniture (but vastly improved in quality) costs only 79 hours of work. A good 9 x 12 Axminster rug now represents the labor of 1.3 weeks as against 1.7 weeks in 1914—and that reduction in spite of the greatly advanced prices. The electric fan of 1914 used to cost nearly 50 hours of labor. Today it costs only about 6 hours, and the difference in efficiency, safety and appearance is even greater. Tire casings for his car used to cost him 90 per cent of a week's wage. Today they cost only 24 per cent and are 10 to 1 safer than the old 1914 tire.

During the pre-war years, the factory worker with a family of four had to work almost fourteen weeks to clothe his dependants and himself. In spite of the fact that clothing prices have gone up 25 per cent, he can now clothe his family with similar garments with the earnings of only 9 weeks work. The paint for his house will cost him only 1.36 per cent of his annual earnings today as against 2.5 per cent of his 1914 budget. And a thousand watts of electric light burning in his home for one hour would have cost him 20 minutes labor at his 1914 job—but only 5 minutes today.

Thus we might run the gauntlet of all commodities —the longer we run the clearer becomes the picture of the height of living standards in America—the nation that was built on private initiative—not government ownership.

ADVERTISING PAGES REMOVED

ADVERTISING PAGES REMOVED

THE PAPER INDUSTRY

Straw Paper and Straw Board

W. W. GALLOWAY
The Hagar Straw Board and Paper Company

THE manufacture of straw paper and straw board is still an important industry. It is true that in the past twelve years a great many competitive products have come on the market in the light straw board field. This is especially the case in what is known as .009 material for corrugating purposes in the corrugated box industry. At the same time, there were 557,500 tons of .009 straw for corrugating manufactured during 1936. This compared to only 325,600 tons made in 1927.

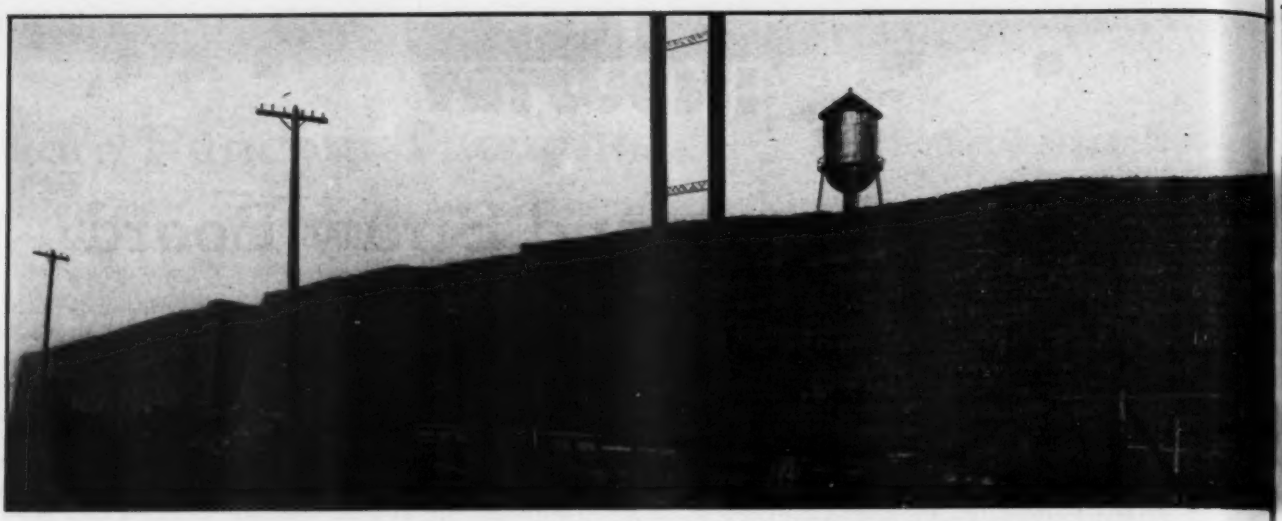
The majority of this tonnage is manufactured in Ohio, Indiana and Illinois, with some additional in Iowa, Kansas, Wisconsin and Michigan. The main source of raw material is field straw threshed from wheat. Oat straw is used in a small way and now and then a little rye straw. Good roads and modern trucks have brought a rapid change in the method of securing the straw from the farm and transporting it to the mill. Most of the straw mills now depend on truck shipments for their raw material. At the same time, in many cases freight cars are used for longer hauls, where the increased expense of trucking makes it unprofitable for the buyer to use trucks. Truck shipments vary in length. The larger mills using heavy daily tonnages of straw can truck their supplies on longer hauls than can the smaller mills. A radius of 40 miles is common, and there are times when well established balers transport their loads 75 or 100 miles. Some of the smaller mills in good wheat territory can obtain their annual supply within a radius of 30 miles from the mill and in these instances no straw is shipped by freight.

Grading of Straw

Frequently, the straw is graded and priced on the basis of being dry or run of rick. The bone-dry straw or all-dry straw brings a higher price than the quality known as "run of rick." Immediately after threshing, it is possible, of course, to get the latter practically bone dry. In the fall and winter the dry straw must be obtained by having the baler throw off the wet covering of the rick in order to bale the center or heart of the pile. This will be bright and dry if care has been used. The run of rick straw is graded into dry or damp or wet by the weighmaster in the storage yard at the mill. Deduction is made for excess moisture using the experience accumulated over the years, and judging from the weight of the bale with reference to its moisture condition, its size and its compactness. A good judge of straw in the yard at the mill will produce uniform results year after year as attested by records kept of the number of tons of straw required per ton of paper made, other conditions, of course, being the same in the manufacturing process. It has been stated by those engaged in this work that a bale of straw will absorb at least three-fourths of its own weight of water. Bales of this kind are seldom brought to the mill in recent years, as balers and truckers do not care to haul the dead weight, knowing that deductions will be made for moisture and the baler and hauler paid only for the estimated dry weight. Moisture tests have been made by evaporating the moisture from a bale of straw in an oven equipped with scales. This demonstration determined whether or not the allowances being made for water were accurate. The quality of the baling varies and depends on standards of workmanship. There are balers who like to make a very tight bale, while others prefer one of moderate compactness. Equipment governs these variables to some extent as the sizes may be 14 in. x 18 in., 16 in. x 18 in., and 17 in. x 22 in., with the length of the bale depending on the length of wire used. The 17 in. x 22 in. bale is tied with three wires, the other two sizes with two only. The balers find that when the straw is excessively dry due to lack of rain it shatters and is difficult to bale, but when it has a normal amount of moisture and sap, it presses readily, will resist rough handling, and does not absorb moisture as freely as it would otherwise.

Mill Storage

Because of the inclement weather, from the first of December through March, most of the mills using straw for raw material attempt to store during the fall months at least a four-month supply of raw material. Economic conditions, business prospects, and individual industrial policies influence this practice so that some plants have a six-months' stock as a minimum, while others use as little as three-months storage. Insurance costs are heavy and there are times when labor costs make stacking expensive. These also are determining factors in formulating storage practices. The insurance companies have restrictions that mills must follow in building storage piles. There is a definite width of aisle way determined for each risk. These may be as little as 35 feet under good protection and may be as wide as 50 feet where fire fighting equipment is limited. The height of the pile also is limited. Stacking equipment in the way of movable elevators makes it easy to build the storage piles up to a height of 50 feet. Tight bales will remain under these weights in good square condition but loose bales will eventually collapse and it is a common thing in wet years to see piles crumble and break down in the middle of the winter. As far as possible, wet bales are culled out and only dry straw put in storage. The sides of the ricks are tapered in as the height increases, and the bales are laid across each



Nine thousand tons of straw in storage. Note aisles

other in the layers to keep them tied in and binding the whole mass together. Usually, piles are of limited size—at the Hager Company, piles are limited to a maximum of 50 feet x 100 feet on the ground, 36 bales high and there must be 50 feet of space intervening from the nearest exposure.

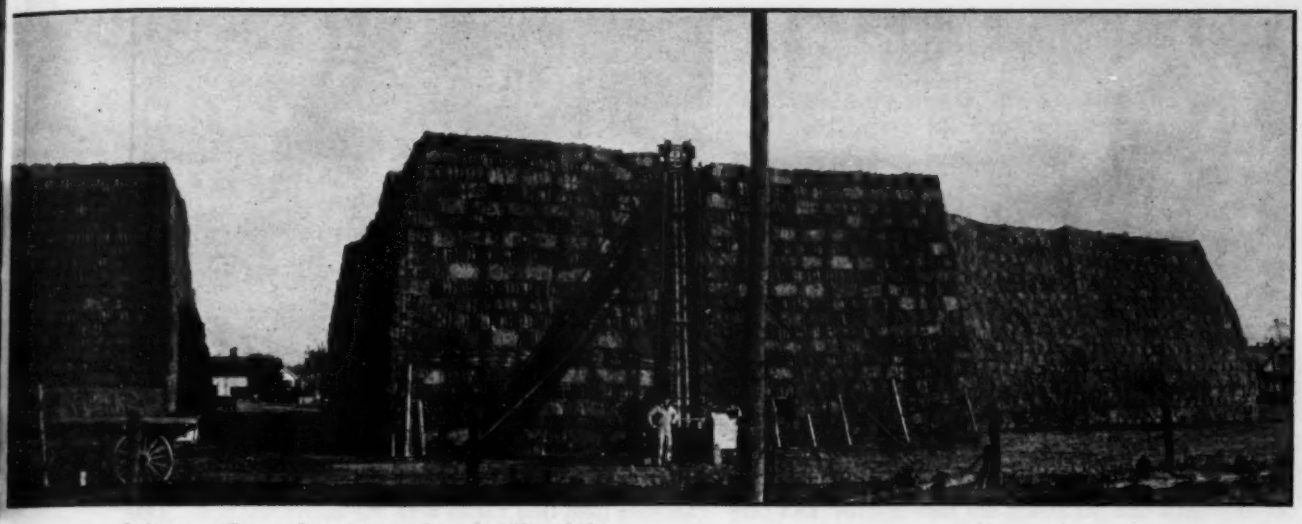
Fire in straw piles spreads rapidly over the outside and then burns slowly. A very heavy acrid smoke results from the combustion. Water does not soak into the piles quickly and a rick will smoulder when apparently saturated with water and will break into flame time after time. The baling wires hold the mass together and if weather and wind conditions permit, the best policy is to isolate the rick that is burning, and cut off the burning part of the stack by making an aisle through it. Wide aisle ways between ricks help remove bales when the rick is being cut into and allow for fire fighting equipment, hose lines, etc.

Rain, sunshine, snow, freezing and thawing will darken the outside of a pile of baled straw and during the course of a winter will saturate three or four layers on top of a rick with moisture. If these outer layers are removed reasonably soon they will not decompose and there will be very little loss in their use. The interior of the rick will usually be found in bright, dry condition. In some places, covered sheds are used for storage. Other plants do not like them as they create a fire fighting hazard. They do prevent decomposition of the top layers and probably will pay for their construction in the savings made. Figures to prove this are not obtainable, but it is a fact that much more straw is stored in the open than under sheds.

The average straw yard is a scene of bustle and activity during the storage period. This begins shortly after harvest and continues until October or November. The coming and going of trucks, the weighing and sorting, elevators being moved to new locations or being operated to carry the bales to the top of the piles, all create part of the romance of this first process industry. Trucks are sent to the conveyor at the mill after being weighed to supply the immediate needs and usually are loaded with straw not fit for storage. If too large a supply of this straw arrives daily to be used in the mill, it is placed in a "come and go" storage pile. This supply is used as soon as possible. It becomes the source of raw material when truck shipments are held up or after storage is completed and only current needs are being supplied. As each rick is built, a record of a pile is kept, showing the average weight per bale after moisture has been deducted. Insurance coverage usually reaches full value on the estimated dry weight basis. When this straw is taken from storage and sent to the mill the average weight per bale can be used to compute the amount for daily requirements. Some mills weigh the daily requirements from the storage into the mill. This constitutes a check on shrinkage and insures a uniformity in the quality of the straw that is cooked.

Cooking Procedure

The straw is conveyed to the rotary room and deposited on the filling floor by means of a pipe and chain drag conveyor. The wire is removed outside the mill and can be baled and sold for scrap. It is necessary to cook the straw with chemicals which are alkaline to soften the fibers so they will draw out in the beating process. Lime slaked in boiling water, soda ash, and pre-made caustic soda are the most commonly used chemicals. Mill practice varies with reference to the quantity of straw put into the cookers. These are usually the globe rotary type approximately fourteen feet in diameter with a capacity of six or seven tons of straw. They are rotated slowly by a worm and segment drive and make one revolution each three minutes or three and a half minutes. It is customary to decide upon the amount of straw to be placed in the cookers and fill them through an opening in the top by removing a lid. The lime solution is then pumped in, the other chemicals added, the head sealed up and bolted shut. The rotary is then started and the cooking is done by supplying steam through the journal by means of a pipe fastened to the inside that rotates with the cooker. The rotating process tumbles the contents and brings it into contact with the chemical solution and the steam. The steam pressure varies; it may be process steam direct from boilers or exhaust steam from turbine or engine power. Pressures run from as low as ten



between piles and conveyor for elevating bales

pounds up to fifty pounds, depending upon conditions and custom. The length of time given to the cooking process is not standard throughout the industry but also depends on mill practice and conditions. There are mills making a complete cycle of filling, cooking and dumping of six tons per fill in twelve hours. Others are using fills of three tons or four tons, and still others may use a twenty-four hour cycle for the three parts of the process. On the whole, the cooking process has been speeded up in recent years. It takes approximately one and three-tenths pound of steam per pound of straw cooked (using bled steam at twelve pounds pressure at the rotary) on a fill of four tons, with no insulation on the rotaries, allowing for a complete cycle of twelve hours.

Each mill has its own standard of yield in paper made per tons of straw cooked. It is easy to understand how this figure varies as some of the mills use a heavy dose of chemical and a long storage period of cooked straw which thoroughly softens and digests the straw before the beating process. These same mills wash heavily in the beating process and sustain rather heavy shrinkage. Others may have a light chemical application and with the same storage time get less digestion of the fiber. They can also get along with less washing as the chemical has expended itself and very little will be carried over onto the wire and felt. Another factor that controls the figure of tons of paper made per tons of straw cooked is the policy of using waste paper or scrap paper material in a definite proportion. Records at the Hagar plant constantly average 1.5 tons of straw per ton of finished paper. This can be varied at will by the use of more or less scrap or waste as furnished for the sheet in the beaters. From general knowledge and statements from others the author believes .009 straw will average 3,400 pounds of raw material per ton of finished paper. The condition of the straw itself is also a determining influence. Badly decomposed straw will not produce the fiber quantity that will come from clean, bright raw straw. Straw cooks best with a moderate amount of sap in it after what is known as the curing process takes place after being baled. Yield and performance under given conditions are more uniform during the winter months. The first month or two after harvest when new straw is being cooked, mill operators from the cooking room through the machine room are always eager to see how the new crop will cook and handle in the beaters and on the machine. The amount of moisture in the raw material from rainfall and exposure to the weather, melting snow, etc., influence the yield and bear upon the condition of the cooked material when dumped from the rotary and conveyed to storage. If too much water is present, chemicals are diluted, reaction is weak, and the digestion is not as thorough as it should be. If too little moisture is present in the cooking process, a parching takes place that cannot be overcome in beating or jordaning. The cooked straw should be moist enough to come from the rotary in a well shredded condition but not wet enough to appear muddy. The water should drain from it readily in the cooked straw room in the piles. There is also a variation in quality between straw grown on clay soil and straw grown in dark loam or rich black loam.

The most of the time the cooking is done by attempting to fill the rotaries with a uniform amount of straw after moisture allowance has been deducted. To this is added a given amount of chemical by weight and the lime is slaked in a measured amount of water by gallons. A continual changing of the cooking formula is disastrous. Nothing will so upset the beating and sheet forming process in a .009 straw mill as tampering with the cooking formula. Superintendents have tried it by attempting to make changes as often as every thirty-six hours to meet changed straw conditions with the result that broke had to be carried out in heavy amounts. Steady production of high quality has been obtained almost immediately when the cooking formula has been used steadily in an over-all way to cover the variables. The best plan is to work out a cooking formula and maintain it, and, if possible, adjust other conditions to the formula upon the basis of experience and good judgment instead of making the formula changeable. The condition of the bales is another variable with which a straw mill has to cope. Sometimes these are frozen and very, very hard, and again they are light and fluffy and will not pack well into the rotary cooker. Although the

Left—Trailers loaded with straw. Storage shed in background. Right—Conveyor for delivering straw from yard to rotaries

cooker may appear to be full when the straw is first put into it, practically all the rotaries have plenty of room for more material after they have been charged with the chemicals and the steam has been applied and they have been allowed to rotate for a half hour or an hour.

When the cook is completed, the steam is blown through a vent pipe to release the remaining pressure. In some mills, the steam is applied under pressure the full length of the cooking and rotating period; in others it is turned off at the end of a pre-determined length of time and the cooking is kept up with the latent heat stored in the cooker. The liquor from cooking is drained from the cooker, the head is removed, and it is started to rotate in order that the contents may be dumped into the conveyor underneath each time the opened head turns down. Another pipe and chain drag conveyor takes this to the cooked straw storage, or, if sufficient room is afforded under the rotary itself, it discharges onto the pile of cooked straw without being conveyed to storage.

Washing, Beating and Jordaning

The cooked straw while hot may be immediately conveyed to the beaters and a sheet of paper made from it that is usable. On the other hand, results favor retention of the cooked straw in storage piles for a period between cooking and beating. This interval allows the stock to cool without getting cold, permits the moisture and excess chemicals to drain out and the heavy mass at high temperature continues cooking and digesting so that the beating is done with less power and better fiber is produced. If too long a storage interval takes place, the high organic contents set up decomposition in the cooked straw. A period of approximately forty-eight hours seems ideal. When ready for use the cooked stock is usually forked into a conveyor by hand until the beater is filled from the conveyor chute. Best results are obtained when the cooked stock is used systematically and methodically. By using the oldest piles in steady rotation, decomposition is kept to the minimum, and the stock going to the beaters is of uniform age and temperature and has had approximately the same number of hours drainage.

When .009 straw is made, there is a step in the manufacturing process that is not common to all papers of other grades. This is the process of washing during beating. As the straw mill is both a pulp and paper mill, the pulp preparation can be completed during the beating process by washing out non-fibrous materials, excess alkalinity, and substances that cling to the straw fibers that reduce the sheet qualities demanded in their use. The amount of washing per beater of straw is another item that varies with the individual mill. One controlling factor is disposition of waste water. It is common for mills located on water supply of such size that stream pollution is not a problem to do more washing than is common in mills not so favorably situated. If all the non-fibrous dirt is retained and carried into the finished sheet, it usually will not have as much stiffness after being corrugated as when the straw is well washed and the fiber used is clean. If all of the alkaline chemicals have not been digested during cooking and through the storage period, it is best practice to remove them by washing in the beater in order that the alkalinity may be at the lowest practical limit when the stock reaches the paper machine and goes on the felt. Some mills employ fresh unused water only, either from wells or a stream supply for the washing. Others utilize water from the paper machine wet end for this purpose. The latter practice is one requiring diligent study and a close observation of fiber characteristics, and the influence these have on sheet formation. In switching from clean water to dirty water, a gradual change from fresh water for washing to machine pit water is recommended so that control may be retained and adjustments made in beating, jordaning, and refining, etc. The re-use of water will tend to keep temperatures in the beater higher than where cold fresh water is employed. A slow removal of the alkalinity and non-fibrous materials will continue the digestion period into the beating. Care must be exercised when higher temperatures are retained in the beater stock. It is very difficult to go into the subject of quantities of water used for washing straw stock. A steady application of effort to reduce the amount of waste water from the mill in one place has lowered the quantity from an average of 24,000 gallons per hour on 21 tons per day output to 6,000 gallons per hour on 30 tons per day output. It must not be taken for granted that the increased output is solely due to reduced washing and it is not likely that the average reader of this article will be confused. It is the author's belief that any straw mill may successfully make a high quality sheet without discharging over 10,000 gallons per ton of paper made. This can be reduced still further with intensive application of science and a knowledge of chemistry.

The washing usually is accomplished by means of a prism-revolving washer covered with wire screen or per-

forated plate of 40-mesh or 50-mesh opening. As the stock moves, the washer revolves by a light belt drive and is submerged into the stock so that the water and dirt and fine materials pass through the screen or plate cover to the sections and are carried by gravity to the journal, passing out through it into the discard piping at the side of the beater. Some work has been done on washing straw while still in the rotary cooker by filling the rotary with fresh water when the cook is completed, putting the head back on and revolving the rotary a few minutes. The rinse water is then emptied and the cooked straw is dumped in the usual way. In some mills, it is the practice to lower two washers to the beater and these are allowed to operate during the first part of the beating process before the roll has been lowered to its final position. The washers are lifted at the end of a given period and no further washing done. Supply water to replace what is removed is being applied just ahead of the beater roll during the washing process. A larger quantity of water may be passed through the coarse straw when the beater is first filled than is the case after the fiber is shortened during the beating process. In case it is necessary to use cooked straw that is not as well digested as usual, it has been demonstrated that the digestion process may be carried out to completion and a satisfactory fiber may be produced by beating this stock without removing by washing any of the chemicals or non-fibrous material. After the digestion process has been taken care of in the beater, then the washing may be started and handled in the usual way. The waste water from the beaters is usually carried off by gravity to the stream upon which the mill is located. If this cannot be done on account of pollution problems, the waste water is conducted to detension basis or reservoirs and impounded until there is a flood stage in the stream or until the weather is cold enough that it may be poured into the stream without damaging fish life. Mills faced with pollution situations must use either dilution during floods or freshets or wait for cold weather to lower the oxygen demand of the stream.

When straw paper sheets are made, the beating process is about the same as when fiber is produced from other stocks. Beater bedplates and beater bars of different kinds have their devotees. The angle bedplate and the corrugated bar are quite popular and are rather generally used. The types of beating equipment also vary with personal experience. Some mills are equipped with breaker beaters from which the stock is pumped to the finishing beater, where it is refined and washed in the usual way. It is usual to fill the beater with the rolls raised, gradually lowering them to the finishing position. If the rolls are dropped too soon, a chopped, stubby, coarse fiber results that will not make a good sheet. A slow drawing out of the fibers by gentle brushing will split the straw into lengthy hairlike fibers that produce a good, stiff finished sheet that will bend in the corrugation and be resilient. Overbeating will produce a very slow stock and the jordaning and refining may add to this condition, which is not desirable. A moderate amount of beating can be followed by proper jordaning and produce the highest quality sheet. Jordan bars and fillings, and different speeds have their advocates. In many cases, these preferences are due to training and previous mill experience. The joints in straw cause considerable trouble for the straw papermakers and must be properly cooked in order to be handled well in the beating and jordaning process. These joints are full of a material similar to paraffin, and, being light, float on the surface of the machine vat. If not properly cooked and beaten, they form hard lumps in the finished paper. These lumps will collect on the machine vat surface, be drawn into the cylinder mold, and come out at the calenders in long, black streaks. Good fiber preparation and good stock handling will keep them distributed.

Rotary charging floor

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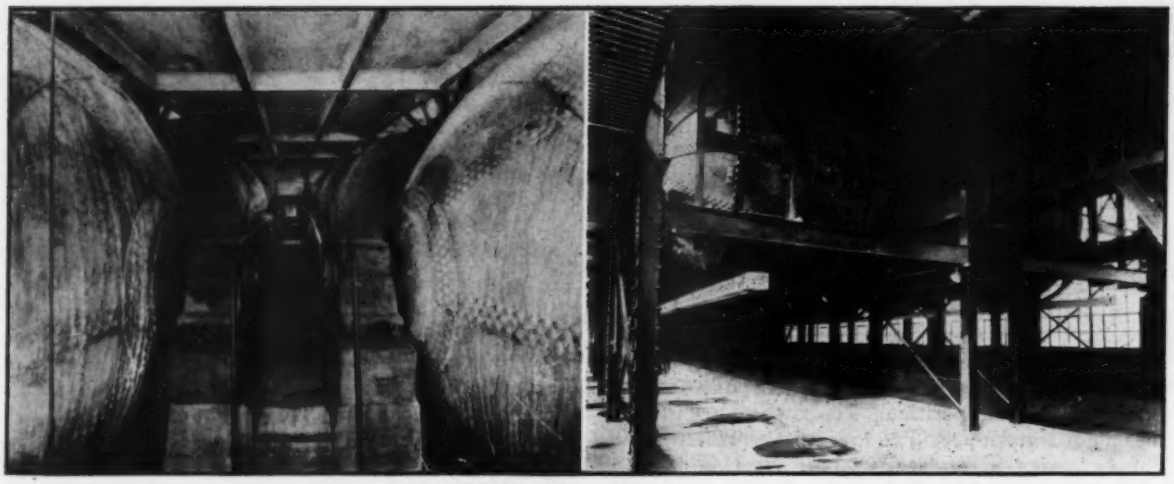


Two large rotary installations

Their condition when leaving the beater is a good index of stock character. At the Hagar plant it has been found preferable to empty the beater while the stock is still rather long and allow the jordans to do the finishing and refining. The jordans seem to do better work and to produce a more uniform type of fiber under these conditions.

The bedplates and beater bars in the manufacture of .009 straw are subject to damage by baling wire, bolts, pieces of chain and other foreign objects that come in with the stock in spite of care. Considerable abrasive sand and fine stone dust from the lime are always present and produce a wearing effect on the knives. It is easier to replace bedplates than beater bars. Because of this, heat-treated fly bars are common. When used with softer materials in the bedplates, the latter take the wear and the bars keep sharp and in good condition. The peripheral speed on the beater roll varies in mill practice in this industry from around 1750 f.p.m. to 2100 f.p.m. Different makes of beaters are built to circulate stock at different speeds and it is possible that the individual installation has its own best r.p.m. and peripheral speed for the roll. There are mills that beat the stock in the presence of more water than do others and there seems to be no very definite standard practice in beater roll speeds. Operators in straw mills are just as eager to secure maximum results with minimum horsepower as are those making other grades of board and paper.

The amount of waste paper or other material that can be beaten without washing (commonly referred to as "broke") will control the type of jordan treatment and will influence it. Scarcely any of the makers of straw paper or board, manufacture their product without using purchased scrap of some sort. It is probably accurate to say that this averages 10 to 15 per cent of the original straw dumped by the beaters. The more regularly and steadily this can be mixed into the straw furnished, the better uniformity in drying and sheet formation can be secured. It can be seen readily that if a beater tender discharges a couple of two-thousand-pound beaters of straw stock into the chest and then follows this with five hundred pounds of beaten-up waste or broke he will have a more difficult time to thoroughly mix the two than if he followed each two-thousand-pound beater dumped with two hundred fifty pounds of broke. Drying will be affected adversely if the waste or broke is fed through the system in waves or surges. Mill operators are careful as a rule to keep the percentage of dilution by waste materials to as low a point as is necessary to secure good corrugating characteristics in the finished sheet. At the same time, they all know there are advantages in the use of a properly limited amount mixed with the straw itself.

Fabrication of Sheet

The final process in the manufacture of paper from straw is that of forming the sheet and turning it out at the dry end of the machine. In this, practically the same procedure is used as with board mills in general. The most of this commodity is still manufactured on single cylinder machines, but there are several manufacturers using fourdrinier machines. The speed at which the sheet is formed varies greatly. Older machines are running 175-200 feet a minute. The new ones, or the older ones that have been thoroughly reconditioned and improved, are making good paper and board at considerably higher speeds. The stock in the cylinder vat is rather free and it is easy to secure wild formation. One cylinder will readily pick up enough fiber to form the finished sheet .009 in thickness. Some of the new vats are in use on straw, but the majority of the cylinders are still of the older type in their method of picking up the fiber and in the direction of flow. In recent years, larger diameter cylinders have become common. About fifteen years ago, the majority of them were 36 inches in diameter. There is the same problem of water removal after the wet felt has picked up the formation as is common in other board manufacture. Such devices as suction tail rolls, suction press rolls and ordinary squeeze presses are in use. The rubber-covered suction press ahead of what is known as the first press is in favor with certain operators and is likely to increase in use because of the lessening of wear on the felt and a reduction of pickups at the first press. Experiments are being run in some operations using white-water on the felt whipper shower with success, and an even temperature all the year around seems to produce

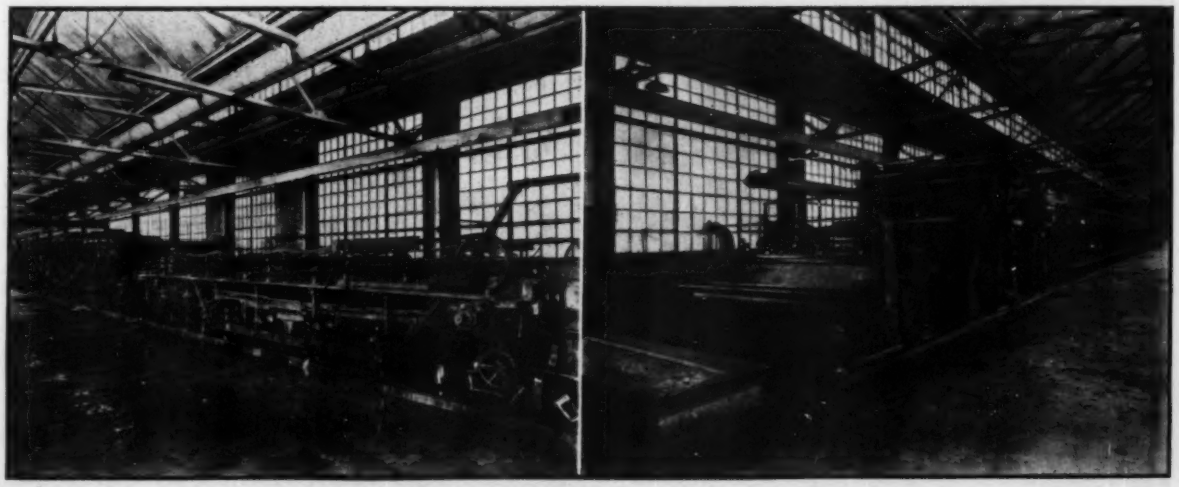
uniform results. This warmer shower water keeps the felt meshes more open and allows for the removal of residue alkalies more readily than is often the case with cold, clear water of a different temperature than that in the cylinder machine vat. The finished sheet is being made to weigh 34 lb. per M. sq. ft. and has a moisture content of from 7 to 10 per cent. It is usually well calendered and given a fairly smooth finish. Shipments are made in rolls of whatever diameter and length suits the box maker's requirements and shipments are in carload lots except where trucks are less costly for transportation. The finished material should bend readily, it should form a good, stiff arch in the corrugation without being brittle, and the bridge should be resilient upon impact without being soft or crushing too readily. Not much attention is paid to a Mullen test, but an effort is made to secure a crushing test that shows a resistance to pressure in the corrugated arch after the top and bottom liner have been placed on the corrugation. By use of a Reihle tester, it has been determined that the sheet as a rule is satisfactory in its use-requirement if it tests 22.0 lb. lengthwise and 15.0 lb. crosswise.

Present Status of Industry and Future Trends

The straw board mill is still important in the industry because of the tremendous quantity of corrugated boxes for packaging and shipping. While substitute products are numerous and will probably continue to appear as time passes and the science of papermaking advances, it seems rather reasonable to expect that for some time to come the straw sheet for corrugating will remain the standard of measure and the unit of comparison for the industry. In addition, it is a source of revenue to farmers in wheat-growing areas in an increasing way. When one considers the statement made in the beginning of this article that there were 557,500 tons of .009 straw for corrugating produced in 1936, and one studies the fact that it takes approximately an acre of ground to produce a ton of straw, and that it takes a ton and a half of straw to make a ton of paper, one can see there is indeed a good farm income from the sale of this fiber which at present is regarded as surplus material. The future probably will see more care given to the collecting, storing and preparing of the straw for use as fiber. Better baling and more baling immediately after threshing will produce a higher quality of raw material for the straw paper mills. Also, farmers probably will find a higher value for this material in supplemental feeding of stock. The coming of the small combine as a method of harvesting wheat for the time being may lessen the amount of straw available in a limited area, but it probably will foster production of new baling devices to gather and bale the wheat stems. These may be more desirable for paper use by reason of the fact that they will be free of wheat heads and the chaff.

Indications at present are that knowledge of the variables in straw and the possible combinations of this fiber with others is very limited indeed. In a very short period of time this industry has changed from a "rule of thumb" type of production, to one under a limited scientific control. It is the author's prediction that the future will see a steady growth of the application of science. There are many untried possibilities in cooking and in the treatment of the raw material before cooking takes place. New fibering devices are coming on the market so rapidly that the industry cannot be sure of what may take place in the transformation of the process of reducing the raw materials to a useful fiber ready for the paper machine. Research is being conducted under splendid management now by a number of manufacturers, and higher speeds, better yields and an improved product to meet use-requirements has resulted. The stream pollution problem will have to be solved and it probably will result in a different method of cooking than is common today. In all cases, cost of finished product will control. Man has conquered so many problems by applying increasing knowledge to them as time marched on that no one dare look at the past and in the present say the future holds no prospect of growth or betterment.

Those of my acquaintance who are surprised at some of the things I have included in the above discussion may lay it to the fact that I have only been at the work of making paper from straw for fifteen years and those others who expected to see a more detailed discussion of points that have been omitted will find the same cause responsible.—*Author's Note.*



Paper machine installation in straw mill. Left—wet end. Right—Dry end

Power Drives in the Paper Industry

FRANCIS A. WESTBROOK

THE question of mechanical power transmission in the manufacture of paper is of great importance. It is especially so because of the variety of machines used in the industry, the exacting conditions existing in many cases, the need of accurate speed control in some of the operations and the large amount of power which is used for certain units. The fact that interruption of most of the operations is likely to result in serious losses is another vital consideration.

A visit to a number of the mills in the Boston district and the lower Merrimac Valley reveals many different mechanical power transmission practices, all working well, and as most of these mills have been in operation for many years, ranging up to over a century, it is possible to observe both the old and the new side by side. Some of the drives may date back ten years or more, while others represent the last word in modernization.

One of the facts about these drives which impresses the observer most forcibly is that V-belts and pivoted motor bases have been of particular usefulness in the older mills. Their use, resulting in shorter center distances for drives, has improved operating conditions by opening up congested areas.

In the mill of Tileston & Hollingsworth, a concern which has been in the business of making paper for 125 years or more, are several different types of drives. Most of them were installed about ten years ago in the course of a modernization program. Some were placed in service much more recently. All have shown by performance to be well adapted to the conditions which they are required to meet.

There are drives consisting of flat leather belts, V-belts, multiple ropes, direct connections through flexible couplings, speed reducers, gears and clutches.

The most striking applications, perhaps, are the multiple rope drives. These drives are mostly for short centers and large speed reductions. A number of high pressure pumps, for instance, are connected individually to 7½-hp. motors through rope drives. The center distance of each of these drives is 60 inches; the diameter of the driver sheave, 5 inches; and that of the driven sheave, 30 inches. Fifteen ⅜-inch ropes are used for each drive.

A number of beaters, likewise, are driven through rope drives. Several of these drives are exactly alike, each including a 50-hp. motor; an 18-inch driving sheave; a 66-inch driven sheave; eleven ⅞-inch ropes; and a center distance of about 96 inches. Another beater drive includes fifteen ropes and a 75-hp. Fynn-Weichsel motor, the motor being used for power factor correction. In this case, the drive sheave is 15 inches; the driven sheave, 84 inches; and the distance between centers, 14 feet. Still another beater is driven through a flat leather belt by a 75-hp. induction motor mounted on a pivoted base. The leather belt is 16 inches wide; the driver pulley, 18 inches in diameter; the driven, 66 inches; and the center distance, 96 inches. The pivoted base, a recent installation, has been very successful in its operation.

All of the rope drives are made of cotton material. Some of them have been in operation since 1923 and are still going strong. Each of these drives is carefully inspected every week-end and receives a dressing every three or four months.

The shake drives on the paper machines include several V-belt installations. There are four V-belts for each drive. The drive sheaves are 10 inches in diameter; the driven sheaves, 22 inches; and the center distances, only 20 inches. Power is supplied by 5-hp., d.-c. motors.

The jordans are driven by 250-hp., 450 r. p. m. induction motors direct connected through Bartlett-Hayward flexible couplings. All of the centrifugal pumps are direct-connected through flexible couplings to 1800 r. p. m. induction motors. The motors for the winders at the end of the paper machine drive through worm gear speed reducing units. These units are totally enclosed and, therefore, clean and easy to maintain.

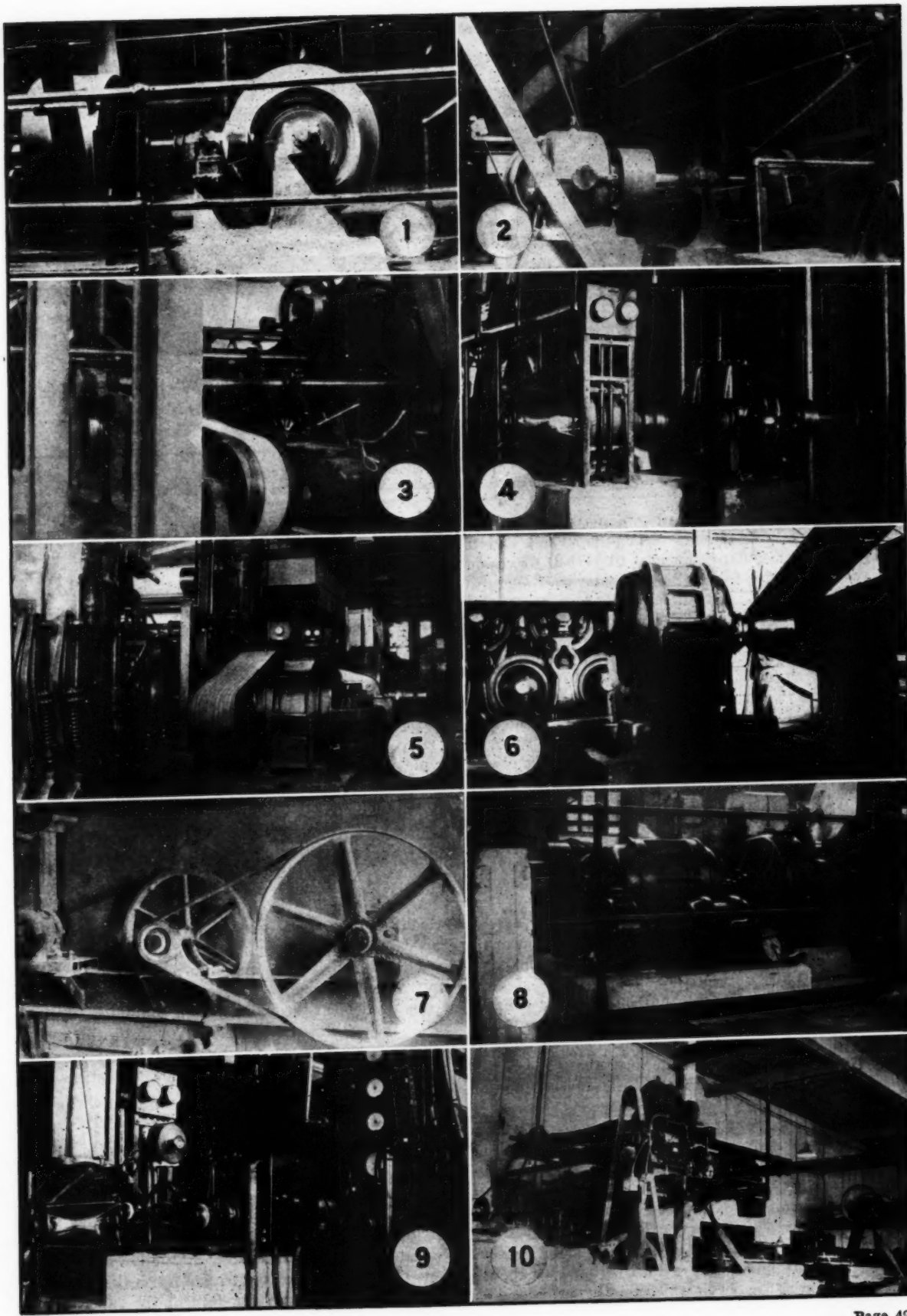
Group drive is employed for the stock chest agitators because the starting load of each agitator is so much in excess of the running load. A McMahon clutch for each agitator permits individual control.

The paper machine drives, of which there are two, were installed in 1923. Both of these drives include individually a Fitchburg reciprocating engine, a direct current generator and a 300-hp., d.-c. motor. The engines operate at an exhaust pressure suitable for process steam and act as reducing valves for the boiler pressure. A rope drive connects the respective prime mover with its paper machine through a main line drive shaft and several flat belts, one for each of the several sections of the machine being driven. Each of the rope drives makes use of six 1½-inch ropes.

Another interesting paper machine drive was noted in one of the mills in the Merrimac Valley. In this case the machine is driven from one long shaft, the power being transmitted to the several drive stands of the machine through flat belts. One drive stand (Fig. 1) makes use of a bevel and spur gear arrangement, the original equipment furnished with the drive. Another section makes use of a Falk type of unit while a Beloit unit (Fig. 2) is used for a third section. Another Falk type unit is used for the cutter at the end of the machine, but, in this case, it drives through a Link-Belt PIV variable speed unit (Fig. 3) by means of which the length of sheet is controlled.

Legends—Page 423

Fig. 1—Paper machine sectional drive from main shaft by belt to bevel pinion and gear speed reducing element to give 90 deg. turn. Fig. 2—Paper machine drive—belt from main shaft to Beloit 90 deg. angle turn gear speed reducer. Fig. 3—Drive with P.I.V. speed control for cutter at end of paper machine. Fig. 4—Sectional paper machine drive showing motor and gear speed reducing unit (Champion-International). Fig. 5—Multiple V-belt drive for winder at end of paper machine (Champion-International). Fig. 6—Pivoted motor base for flat belt short center drive on beater (Champion-International). Fig. 7—Color mixer drive (Champion-International). Fig. 8—Supercalender-threading motor drive in front of main running motor (Champion-International). Fig. 9—Supercalender motor and control station (Champion-International). Fig. 10—Drive for coating machines (Champion-International).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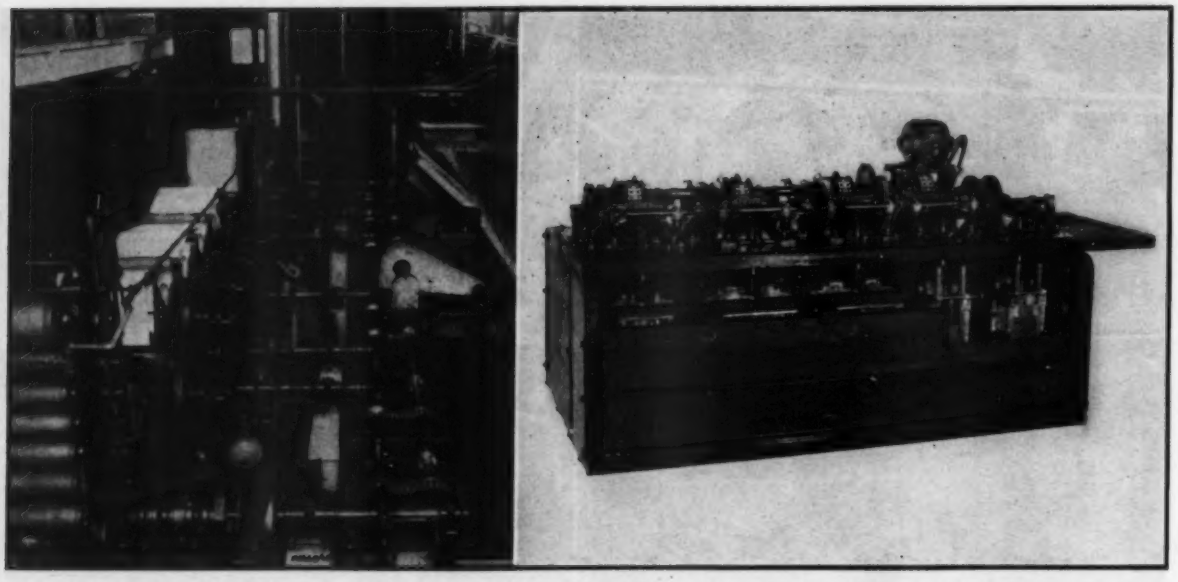


Fig. 11 (left)—Experimental paper machine at U. S. Forest Products Laboratory equipped with variable speed drive. Fig. 12 (right)—Variable speed control on stock metering and proportioning machine

In this same mill, gear and pinion type drives are employed on triplex plunger stock pumps, and V-belts on Nash vacuum pumps. Each of the V-belt drives on the vacuum pumps is on 42-inch center and operates with a 3.5 to 1 speed reduction. A breaker beater combination type of drive makes use of a 250-hp., 850 r. p. m. motor, a Link-Belt silent chain drive, a counter shaft and a rope drive. The Link-Belt silent chain drive connects the motor with the counter shaft, this arrangement being in the basement, and the rope drive connects the counter shaft with the breaker beater which is located on the floor above. Ten 1½-inch cotton ropes on 20-foot centers are used for the rope drive. The center distance of the silent chain drive is 18 feet.

An 1800-lb. beater in another mill is driven through 12 V-belts by a 720 r. p. m. 100 hp. variable speed motor, both the motor and the beater being on the same floor. In this case, the diameter of the motor sheave is 12 inches, the beater sheave, 66 inches and the center distance, 72 inches.

In this same mill, some of the jordans are driven through flat belts by waterwheels. Two of the jordans, however, have individual motors, one of 200 hp. and the other, 150 hp. Both of these motors are located on the floor below the jordans, and individually connect with a countershaft on the same floor through a V-belt drive and the countershaft, in turn, is connected with its corresponding jordan on the floor above through a flat belt. There are fourteen V-belts on each one of these two drives.

One of the cutters in this mill, not associated with a paper machine, is provided with a Link-Belt PIV control for the purpose of controlling the length of sheet.

Numerous types of motors and mechanical power transmission units are installed in the mill of The Champion-International Paper Company. In fact, all of the drives in this mill are individually motor driven.

The paper machines are provided with Westinghouse sectional drives (Fig. 4) in which totally enclosed, d.-c. motors are used. Gear speed reducers and flexible couplings connect these motors to their respective sections.

A.-C., slip-ring motors are used to drive the winders. Each of the winder motors is equipped with a 12-groove sheave, 8 inches in diameter, for V-belt drive (Fig. 5). The center distance of each of these drives is 42 inches, the V-belts connecting with a 24-inch driven sheave that is located on a countershaft. Then there is a gear to pinion and pinion to gear drive to a shaft with flat leather belts to the rolls of a winder.

Several kinds of drives are used on the beaters. A typical drive (Fig. 6) includes a Rockwood pivoted base mounted, 50 hp., 1200 r. p. m. induction motor with 8-inch pulley, a 50-inch driven pulley, a center distance of 8 ft., and a 14-inch flat leather belt. One beater is powered with a 100-hp., 500 r. p. m. slip-ring motor. This drive uses no pivoted base for the motor. Its center distance is 12 feet.

A very compact drive is employed on a save-all in which wet broke is salvaged by mixing it with pulp. In this case, a 5-hp., 1200 r. p. m., totally enclosed, induction motor is directly connected to a Falk speed reducing unit, which, in turn, is connected to a gear and pinion reducing element through a flexible coupling. With this drive, the speed is reduced from 1200 to 10 r. p. m.

The jordans are each individually direct connected to the motors, a 300-hp., 400 r. p. m. induction motor being the largest of them. A large Nash vacuum pump is V-belt driven by a 75-hp. induction motor. There also is a color mixer which is driven by a 1-hp., 1800 r. p. m. induction motor through a simple but ingenious drive (Fig. 7) which reduces the speed to about 50 r. p. m. In this instance, the small motor is connected to a countershaft through a V-belt drive which makes use of a small diameter motor sheave and a large diameter countershaft sheave. A similar arrangement is used to connect the countershaft with the mixer.

The largest and most modern of the supercalender

drives (Fig. 8) utilizes an 875 r. p. m., 150-hp. slip-ring motor for actual operation. In addition, there is a 10-hp., 1200 r. p. m. induction motor for threading. This latter motor drives through a reducing gear and silent chain to the shaft of the large motor which it turns over during threading operations. The large motor drives direct to a Falk speed reducer and then through a flexible coupling to the calender. Operation is controlled through a central control station (Fig. 9).

A typical coating machine drive (Fig. 10) consists of a 5-hp., double-ended shaft motor, which is mounted on an overhead framework and is connected on one end through three V-belts to the rolls and on the other, through two V-belts to a small gear reducing unit with a silent chain drive to a magnetic clutch. There is another chain drive from this clutch to the chain conveyor used to carry the coating paper through the drying tunnel when the run is started. Slip-ring motors are used on some of these machines; direct current motors on others. In all cases, separate motors, each equipped with a V-belt drive, are employed for operating the brushes. Slip-ring motors also are used for the paper cutters.

Since only rather limited reference has been made to mechanical variable speed control, it should be stated that such equipment is very versatile in application and should not be overlooked. They can be used for transmissions up to 200 hp. and have the advantage of providing for accurate speed adjustments without stopping the machinery to obtain them. Such units have been used by Johns-Manville, the American Writing Paper Company and others for the driving of paper machines (Fig. 11). They likewise have been applied to winders and metering equipment (Fig. 12) as employed in the making of newsprint. In this latter case, as with some other types of papermaking equipment, the variable speed control unit is incorporated as an integral part of the equipment by the equipment manufacturer. They can be applied without difficulty, however, to any installed machinery as an item of modernization.

A Simple and Practical Friction Test

W. F. SCHAPHORST, M. E.

WHEN making adjustments on the working parts of a motor, engine, driven machine, or intermediate drive, one is often at a loss as to whether that adjustment has been properly made. If a bearing has been taken up a little, how can one know that he has not taken it up too much? The method that is perhaps most frequently used is to make a "test run." The engine is operated for a short period after making the adjustment and it is noted whether or not the friction is excessive enough to cause the bearing to heat. The degree of heat is usually determined by the rough and ready method of touching the part, and in that way a personal element enters which varies greatly with different operators.

A better method that can be quickly applied, that eliminates the personal element, and which has been found to give looked-for results in most cases, is to note the time required for the engine or motor to come to a standstill after turning off the power. Take the stopping time *before* making the adjustment. Take the stopping time *after* making the adjustment. Compare the two. The greater the stopping time, the better. Make it a practice to take the stopping time every once in a while, and keep a record of it. There must, of course, be no load on the engine or motor at the time the trial is being made.

This test is possible because of the fact that all engines are equipped with flywheels, and when the engine is running at normal speed the energy stored in the flywheels has a constant value which is easy to compute mathematically. Also, rotors of electric motors possess mass and weight and consequently they do not stop instantly. The energy of a rotor, as well as of a flywheel, varies directly as the *square* of the velocity, multiplied by the weight.

It is best to allow the running conditions of the engine or motor to become normal before the power is turned off. For that reason the preferred time for these friction tests is at shutting down time when the engine, motor, bearings, etc., are at normal operating temperature. Or, during the noon period.

This method can also be used to determine defects in an engine or drive—defects of a frictional nature. For example: if it is found that it takes fifty seconds for an engine to come to a stop on shutting down one night, and the next night the same engine stops in forty seconds, it is entirely reasonable to assume that the engine was overcoming more friction on the second day than on the first day. In other words, the frictional horsepower was greater and consequently the mechanical efficiency less on the second day than on the first.

It should be the duty of the operator to determine the cause of this increased friction which may have been caused by some adjustment that was made. Or, perhaps the oiling system is defective. If the engine runs smoothly during the usual run, and on stopping the time required to stop is the same every night, the operator can rest assured that the engine has no frictional defects. It should be the constant aim of the operator to make the time of stopping as *great* as possible because then the friction horsepower is least and the mechanical efficiency is greatest.

History of Kraft Paper Industry in Louisiana

GEORGE W. MITCHELL
Bogalusa Paper Company, Inc.

NONE of the experimental missiles of the papermakers, loosed in the deep South in the first decade and a half of the present century, came to earth within the boundaries of the State of Louisiana. They, instead, fell in her neighboring states—Mississippi and Texas. It was in these latter states that industrial enterprise, coupled with calculating research and bold vision, gave birth to the Gulf States' kraft industry.

However, modestly disclaiming pioneer honors, Louisiana lost no time in adopting the infant industry and by 1916 she had proven herself an efficient foster-parent, a good provider. Since that year, Louisiana has advanced apace with the industry that has now become one of the most potent factors in the industrial growth of the modern south.

All industry has guided itself through economic channels of failures, successes, mergers and production interruptions, and the paper industry in Louisiana is no exception. It is along such a devious course and through such transformations that the first paper mill established in the State made its way.

At the beginning of the century, seeing the industrial potentialities of a by-product of the sugar refining industry, the United Railway and Trading Company, of Braithwaite, Louisiana, erected a mill there to manufacture paper from bagasse. This material, the fibrous residue after sugar is extracted from the cane, was available in large quantities and, with the introduction of the sulphate pulping process to this country, approximately a decade in the future, represented practically the only pulp source.

Utilizing this same material, the mill at Braithwaite maintained a 20-ton per day production schedule for years until, in 1917, when the practical demonstrations of the sulphate process in pulping southern resinous woods had furnished tremendous impetus to the South's paper industry, it was bought by the E. Z. Opener Bag Company.

During the next decade, expansions and improvements were made in the mill and the parent organization was enjoying the position of one of the pioneers in the new U. S. kraft industry, and producing more than 45 tons of kraft wrapping and bag paper daily. A new financial structure was again created in 1928 under which the mill operated for a short time. The original mill site at Braithwaite now shows no evidence of the paper industry that thrived there for almost three decades, but as if machinery were not completely inanimate, it is still part of the pulse of the southern paper industry. For much of the machinery added during the years of the mill's activity was moved to Tuscaloosa, Alabama, when the controlling Gulf States Paper Company, erected its new mill there—and the machinery is still in operation.

Bogalusa, located near the Mississippi state line, in Washington Parish, Louisiana, is now familiar to the paper industry as the site of the Bogalusa Paper Company, and had long been known to the lumber industry as the town that sprang up around the operations of

General view of the plant of the Bogalusa Paper Co.

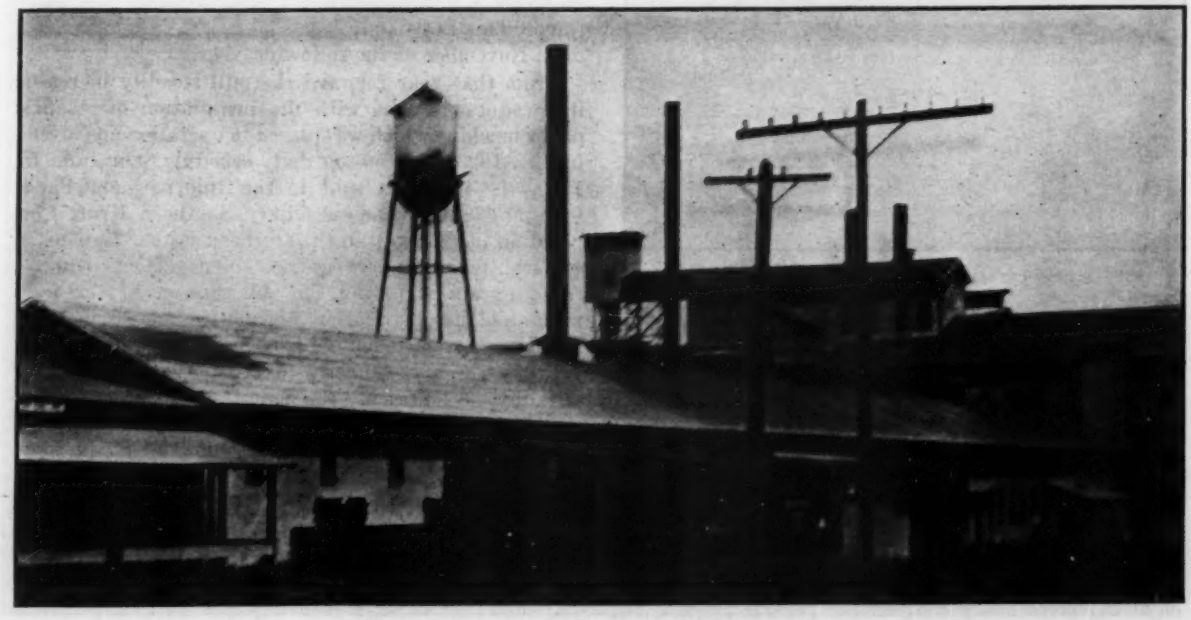
Plant of Brown Paper Mills

Photo—Griffin Studio

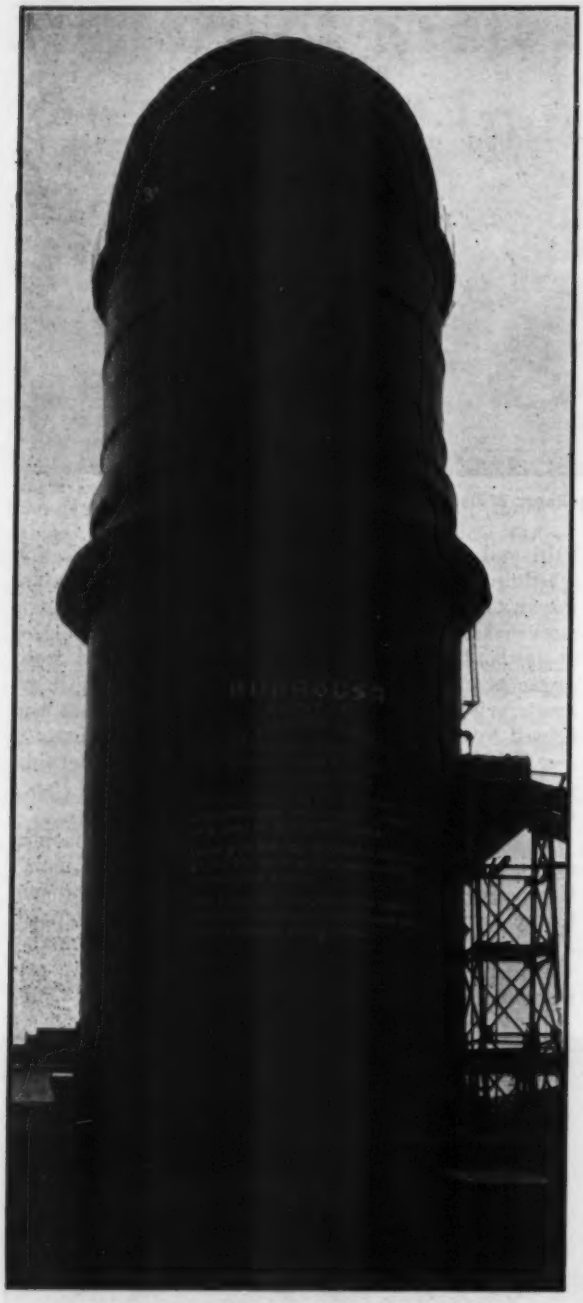
the Great Southern Lumber Company. As is the case of the operations at Braithwaite, there still exists at the Bogalusa Paper Company material evidence of another mill that previously operated as an entity but which has since been absorbed into a materially larger industrial machine. The mill to which must go credit for pioneering in the paper industry in Bogalusa is that of the old Louisiana Fibre Boxboard Company, a name little known even to veteran papermakers.

The mill was built during 1913-1914, incorporating a sulphate pulp mill and one cylinder machine, with a daily capacity of 50 tons of what was then known in the trade as jute container. The mill continued to operate under this status for a relatively short time and was shut down when the original owners found the profits too lean and were forced to abandon the venture. After having been idle for about two years, the entire property was acquired by new interests in 1916, and operated successfully on the same production schedule until 1919, when it was bought by the Bogalusa Paper Company, then in its infancy and with little more behind it than a year's production schedule of upwards of 100 tons of container board daily. A wood products plant now occupies the former site of Bogalusa's original paper mill and the machine that was housed by the Louisiana Fibre Boxboard Company is now, as the result of extensive repairs and modernization, producing specialties at the Bogalusa Paper Company.

There was, until its partial demolition a few months ago, a huge incinerator at the Great Southern Lumber Company's sawmill that stood for years as a monument to the organization of the Bogalusa Paper Company. From the founding of the Great Southern Lumber Company, in 1905, until the fires within it were permanently extinguished, considerably more than 3,000,-



Part of the mill of Calcasieu Sulphate Paper Co.



Old refuse burner of Great Southern Lumber Co.

000 cords of sawmill refuse were dumped into the maw of this great waste burner. With the ultimate practicability of the sulphate process for the pulping of southern woods assured and with a desire to convert this waste into profit, executives of the Great Southern Lumber Company created a subsidiary, the Bogalusa Paper Company, and authorized construction of a second pulp and paper mill in Bogalusa. Ground for the new project was broken in the fall of 1916 and by early 1918 the original mill units were completed.

For a time, a considerable portion of the output of eight digesters was placed on the general market, but by July, 1918, two cylinder machines were operating in full swing on a production schedule of upwards of 100 tons of filled container board daily. In the first of the year 1919, the new enterprise encountered difficulties and was forced to shut down for about five months. In July of that year, however, the entire mill was placed in operation again, the renewal of operations being practically contemporaneous with the purchase of the interests of the Louisiana Fibre Boxboard Co. Since then there has been no interruption in the production schedule except for repairs. The dryer section of the machine bought from the Louisiana Fibre Boxboard Co. was at first adapted to the drying of pulp, but after seeing service for a time in this capacity, the machine was pressed into duty as a fully equipped paper machine.

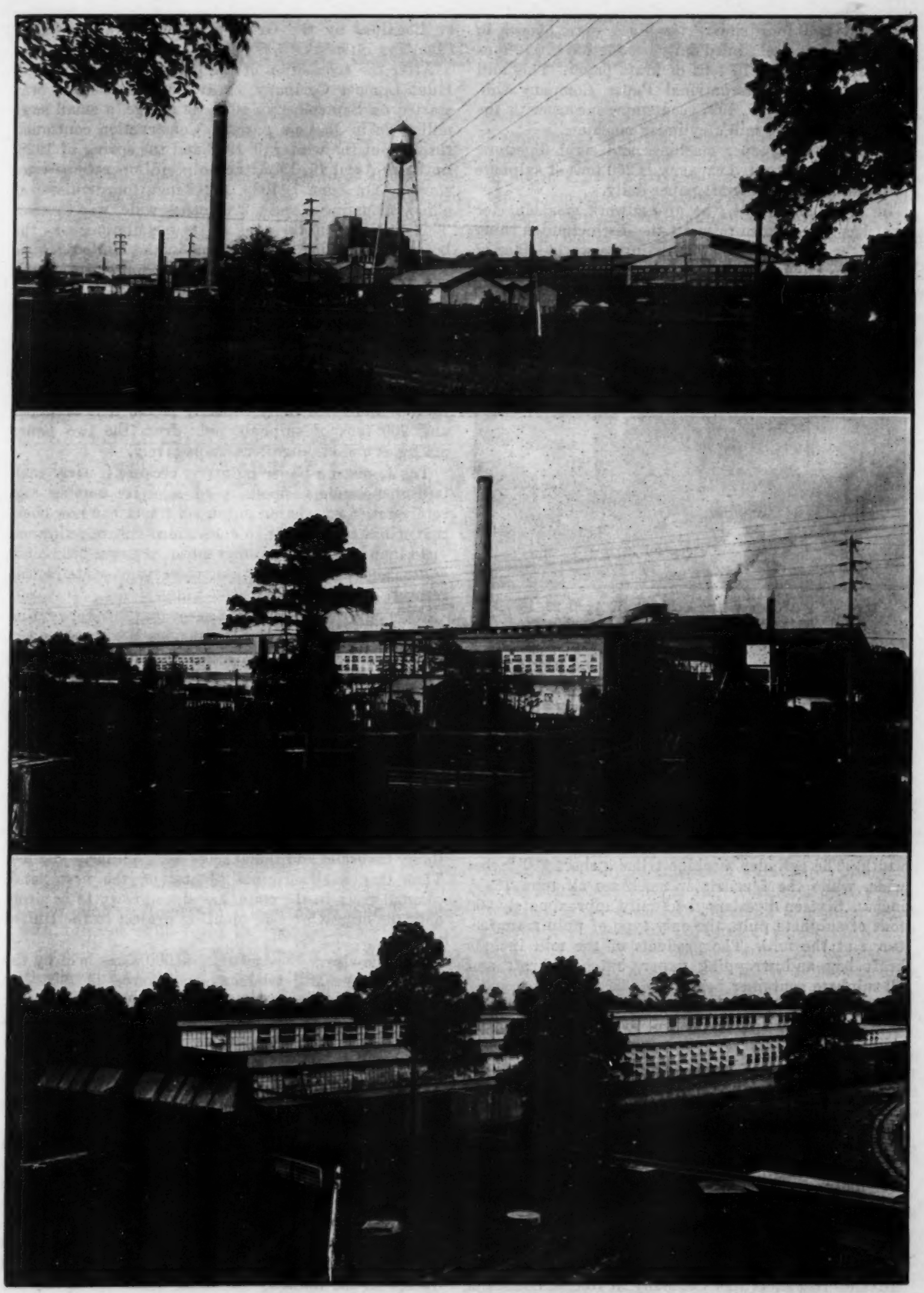
The equipment of the mill then consisted of a 112-inch, 6 cylinder machine, a 118-inch 5 cylinder machine and a 106-inch 3 cylinder machine, the maximum trim of the three machines being 112 inches.

Indisputably the largest company engaged in the manufacture of sulphate paper in southern United States, The Southern Kraft Corporation, a subsidiary of the International Paper Company, gained its first foothold in Louisiana in 1925 with the purchase of the holdings of the Bastrop Pulp and Paper Company, of Bastrop, Louisiana.

The history of the development of the Southern Kraft Corporation in Louisiana is in itself an epoch in the expansion of the paper industry in the state—an epoch which embraces the period from 1920 to the present. In December of 1920, the Bastrop Pulp and Paper Company put in its bid for chronological precedence over another mill located in Bastrop, which has also since been absorbed by the Southern Kraft Corporation. In that month the pulp mill of the Bastrop Pulp and Paper Company, constructed during the year, was placed in operation. After a few days run of pulp, however, the pulp mill was shut down and operations were not resumed until March, 1922, when a regular daily pulp production schedule of 70 tons was instituted. This kraft pulp was sold to the general market until November of the following year.

From that year forward the mill steadily increased its production, first with the installation of its first paper machine which was placed in operation on November 25, 1923, on a 50-ton daily schedule. On June 15, 1925, the mill was sold to the International Paper Company, giving the subsidiary Southern Kraft Corporation its first mill in the southern states. Expansion was continued under the new management in 1926, the program including the enlargement of the pulp mill and the installation of another paper machine which was started on September 23 of that year, increasing the mill capacity to 110 tons of kraft paper per day. At present, the two fourdrinier machines, which trim to 144 inches, produce 140 tons of paper a day while the rated pulp production of its six digesters is 150 tons.

The history of the Louisiana Pulp and Paper Company, which was to be the second mill of the Southern Kraft Corporation, dates back to 1924. In that year and during the greater part of 1925, Bastrop boasted the construction of a second paper mill, larger than the first. During the last months of 1925, the pulp



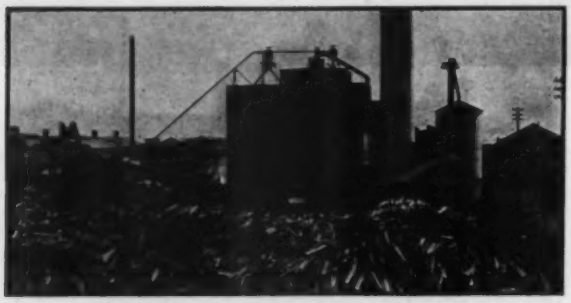
Mills of the Southern Kraft Corporation at Bastrop

Photos—Glen's Studio

mill and two fourdriniers machines were placed in operation with a scheduled daily production of 170 tons of kraft pulp and 110 tons of kraft paper. This mill was sold to the International Paper Company subsidiary on March 15, 1927, contemperaneous with the installation of the mill's cylinder machine.

With its three paper machines and eight digesters, the mill's present rated capacity is 200 tons of sulphate pulp and 210 tons of kraft paper daily.

In September, 1924, the groundwork was laid for what has since grown to merit the distinction of being one of the largest sulphate mills in the world—that of the Brown Paper Mill Company, at Monroe, Louisiana. At that time a fourdrinier machine, with a production of 22,000 tons of sulphate wrapping and bag paper a year, was installed. Then, to meet the growing demand



View of E-Z Opener Bag Co. mill on April 28, 1927. This mill has since been demolished

in the sulphate paper market, a second fourdrinier machine was placed in operation three years later.

In the year 1930, the mill was expanded to its present daily production capacity of approximately 600 tons of 100% sulphate paper. In effecting this production expansion, a third fourdrinier machine and a cylinder machine were added in the paper mill, the former starting up in August, 1930, and the latter in September of that year. The equipment at present includes the three fourdriniers and the cylinder machine, all of 176-inch width. The cylinder machine trims a sheet 160 inches wide, while the fourdrinier machines all trim 163½ inches. Sixteen digesters yield daily approximately 600 tons of sulphate pulp, the only type of pulp manufactured at the mill. The products of the mill include kraft bag and wrapping paper, butchers kraft and all-sulphate container board.

It is estimated that the Brown Paper Mill at Monroe, as it now stands, represents an investment of some 15 millions of dollars.

One of the more modern, though smaller mills in the State, was built by the Calcasieu Sulphate Paper Company, at Elizabeth, Louisiana, in 1925-1926. Designed as a 35-ton kraft pulp and paper mill, the mill began operating in June, 1926, with two digesters and one 108-inch fourdrinier machine, trimming to 102 inches. The daily capacity of the mill is now rated at 40 tons of kraft wrapping paper and 55 tons of sulphate pulp.

In mushrooming the growth of a small community and providing formerly non-existent accommodations for its employee-citizens, the operations of the Southern Advance Bag and Paper Company, at Hodge, Louisiana, furnish a modern counterpart of the work done earlier at Bogalusa by the Great Southern-Bogalusa Paper Company interests.

After the acquisition of the property of the Hodge-Hunt Lumber Company, excavation for the mill was started on September 5, 1927, at Hodge, a small sawmill town in Jackson parish. Construction continued throughout the winter of 1927 and the spring of 1928, until, on April 15, 1928, the pulp mill operations were started. On June 1, 1928, a 242-inch fourdrinier machine, trimming a sheet 220 inches wide, was started. This machine, at the time of its installation, was the largest fourdrinier in operation in the United States. Also housed in the modern plant was a battery of thirty-some bag machines, capable of producing upwards of five million single-walled bags per day. Shortly after installation of the first fourdrinier machine, a second, 158 inches in width, was placed in operation.

The original capacity of the mill, 100 tons each of kraft paper and pulp, has since been stepped up until, in 1937, its rated daily capacity is 190 tons of paper and 200 tons of sulphate pulp from the two paper machines and six digesters, respectively.

The Louisiana paper industry, because it early realized the economic necessity of selective cutting and reforestation of existing pulpwood tracts, can now boast that it has come closer to a sustained future pulpwood yield than several of the other southern paper-producing states, and that it yields first place to no state in this respect.

Although comprehensive figures on the reforestation work being carried on by the various Louisiana papermaking interests are not available, striking examples of the work being done are found in the operations of the Bogalusa Paper Company.

To Henry Hardtner of Urania, Louisiana, goes the unanimous credit for starting the reforestation program in the state of Louisiana and great impetus to the movement was furnished by the late Col. W. H. Sullivan, of Bogalusa. Consequently, reforestation was begun in Bogalusa at an early date (1920), with the planting of 800 acres to pine. Between 1920 and 1931, thirty thousand additional acres were similarly planted. Thus this small original plantation, the first hand-planted tract in the state, has since grown to be probably the largest private planting project in the United States.

Notable also is the fact that 50,000 acres held by the Brown Paper Mill Company, at Monroe, in 1924, has since grown to embrace 300,000 acres, the greater portion of which is under reforestation. These two examples are not by any means isolated cases, for every paper mill in the state is working hand-in-hand with the forestry division of the state department of conservation toward the collective goal of a perpetual pulpwood supply.

Thus, with an almost unlimited supply of pulpwood assured through comprehensive reforestation programs; with research each year increasing mill efficiency, pulp yield, and the value of by-products extracted in the manufacturing process; and, lastly, with the easy accessibility of major markets from Louisiana, the state promises, in the future, to become an even more vital factor in the industry in which it has so rapidly expanded and prospered.

Stock Loss Slide Rule

D. S. DAVIS
Dale S. Davis' Associates

EVERY paper mill which goes in at all for technical control keeps a close watch upon effluent losses. The usual practice is to install a rectangular weir of suitable width in each line carrying whitewater and to provide for sampling the effluent, either manually or mechanically. Twenty-four hour composites of the samples are made and determinations of solids content are run daily. These data, together with the average rate of flow as calculated from the liquid level records, enable estimation of the stock loss.

The only part of the daily stock loss determination likely to give trouble to the ordinary whitewater body is the calculation. For best results he should be provided with either an alignment chart or a special slide rule since these require no formula to be remembered nor any pointing-off in the result. Alignment or nomographic charts for handling effluent calculations having been presented previously (1, 2) it is the purpose of this paper to describe the design of a special slide rule intended solely for this purpose.

The Francis formula for flow over a rectangular uncontracted weir is

$$Q = 3.33\ b\ H^{1.5}$$

where Q = rate of flow, cubic feet per second
b = width of the weir, feet
and H = head on the weir, in feet.

For paper mill purposes it is more convenient to deal with different units, using the formula,

$$Q = 180\ b\ H^{1.5}$$

where Q = rate of flow, in gallons per minute
b = width of the weir, in inches
and H = head on the weir, in inches.

The stock loss, W, in pounds of air-dry fiber per 24 hours is given by

$$W = 13.33\ Q\ c = 40\ b\ c\ H^{1.5}$$

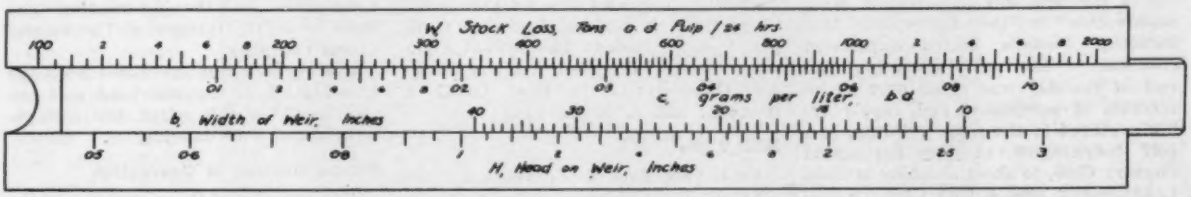
where c is the consistency in grams of bone-dry fiber per liter of whitewater.

The computation consists of raising one value to the 1.5 power and of a series of multiplication operations. This can be handled by logarithms and in designing a slide rule it is sufficient to mount logarithmic scales on a slide rule blank in such a manner that the logarithmic form of the equation is satisfied,

$$\log W = \log 40 + \log c + \log b + 1.5 \log H.$$

This is attained as shown in the figure where the three scales, W, c, and H increase from left to right while the b-scale increases in the opposite direction.

Weirs ten to forty inches in width are usual and heads of 0.5 to 3 inches are encountered while consistencies range from 0.1 to 1.0 gram per liter. A suitable modulus or length of scale representing one unit in plotted function is 25 cm. so that the W, and c-scales can be marked off by means of the C or D-scales of a 10-inch slide rule, while the b-scale can be marked off by means of the CI-scale of the same slide rule. The H-scale is laid off as if the modulus were 1.5x25 or 37.5 cm. This can be done by reading values of $H^{1.5}$ from tables or a log-log slide rule, plotting the values by means of the C-scale



of a 10-inch slide rule, marking each point with the proper value of H. The lengths of the scales are,

$$\text{for W,}\quad 25 \log \frac{2000}{100} = 32.53 \text{ cm.}$$

$$\text{c,}\quad 25 \log \frac{1}{0.1} = 25 \text{ cm.}$$

$$\text{b,}\quad 25 \log \frac{40}{10} = 15.05 \text{ cm.}$$

$$\text{H,}\quad 37.5 \log \frac{3}{0.5} = 29.17 \text{ cm.}$$

The scales are drawn on smooth white paper and glued to the blank. The W, c, and H-scales should be centered while the b-scale is placed in a position which satisfies the equation. Assuming values of b = 10, c = 1, and H = 1, W becomes 400. In locating the b-scale one should align c = 1 with W = 400 and start the b scale at b = 10 over H = 1.

The use of the special slide rule is illustrated as follows: What is the daily stock loss when the average head for the day is 1.10 inches for a 36-inch weir when the composite sample tests 0.500 gram of b. d. fiber per liter? Set 36 on the b-scale over 1.10 on the H-scale and over 0.5 on the c-scale read the effluent loss as 830 pounds of air-dry fiber per 24 hours.

It should be noted that the W and c-scales can be used together for ordinary multiplication and division operations enabling the special slide rule to find other applications around the laboratory. When used for such purposes the scale finits, of course, are disregarded.

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Superintendents Hold 18th Annual Convention

THERE is an old saying that all work and no play makes Jack a dull boy. Maybe it was with such a thought in mind that the program of activities for the eighteenth annual convention of the American Pulp and Paper Mill Superintendents Association was planned. At any rate, the convention, held in Springfield, Massachusetts, on June 23, 24 and 25, 1937, was well interspersed with activities that involved both work and play.

The convention opened on the morning of the first day at 9 o'clock with registration in the Industrial Arts Building, Eastern States Exposition grounds. Following registration, the rest of the day was given over to inspection of equipment and supply exhibits staged in the same building, to a golf tournament at the Springfield Country Club, to skeet shooting at East Longmeadow Rod & Gun Club, to mill visits and conducted tours, and to a New England clambake in the eveping that was climaxed with entertainment and dancing.

Golf Tournament

Weather conditions were ideal so that the turnout for the golf tournament was exceptionally large. In fact, approximately 120 salesmen's and guest cards alone were entered for it.

The Andrew Muirhead Memorial trophy, a sterling silver water pitcher, was won by Mr. B. Beasley of The Brown Paper Mill Company, Inc., Monroe, Louisiana, for the best score in the tournament. His low gross was 79. Other winners in the Superintendents' low gross division included F. W. Johnson, Rhinelander Paper Co., Rhinelander, Wisconsin; E. R. Neblett, Standard Paper Company, Richmond, Virginia; C. J. Ludwig, Mead Corporation, Chillicothe, Ohio, and C. P. Ludington of the E. B. Eddy Company.

The low net contest winners included E. J. McDonnell and R. W. Meyer of Fitchburg Paper Co. and Badger Paper Mills, Inc., respectively; C. E. Stoke and T. Imbleau of Tomahawk Kraft Co. and Provincial Paper Co., respectively; F. L. Zellers and H. Kruse of French Paper Company and Nashua River Paper Co., respectively; and Fred Doutt, John P. Kennedy and J. N. Stephenson of Champion Paper and Fibre Co., American Writing Paper Corp. and the *Pulp and Paper Magazine of Canada*, respectively.

The longest drive, the 16th hole being selected for this exhibition, was won by E. Peterson of the B. F. Goodrich Company. L. L. Griffith of Heller and Merz tied with C. P. Ludington for the nearest drive to the pin in the 13th hole, the prize being given to Mr. Griffith because of Mr. Ludington's success in winning one of the low gross prizes.

The low gross prize in the salesmen's and guests' division was won by Robert Zellers, with a score of 77. Other prize winners among the salesmen and guests included: Samuel R. Anderson, Hooker Electrochemical Co.; Spencer Brown, Appleton Woolen Mills; Fred Schneider, Hampden Color and Chemical Co.; Henry F. Bigelow, Weyerhaeuser Timber Co.; H. W. Sherman, Northern Paper Mills; Curry Watson; C. L. Bachelder, Hercules Powder Company; Charles W. Beauchamp, Link-Belt Company; A. F. Bailey, The duPont Company; David Blanchard, Magnus Chemical Company; J. H. Dow, Castle & Overton; and A. P. Knaus.

Mill Visits

On the schedule of mill visits was the plant of the Chapman Valve Manufacturing Company at Indian Orchard and that of Cheney-Bigelow Wire Company at Springfield. There also was included in the schedule the mills of the American Writing Paper Corporation (Linden Division, Gill Division, Laboratory), Holyoke; Parsons Paper Company, Holyoke; Newton Paper Co., Holyoke; American Tissue Paper Company, Holyoke; and Strathmore Paper Co. (No. 2 Mill), Woronoco.

Luncheon for the golfers was served at the Springfield Country Club; while the mill visitors were guests at luncheon of the Chapman Valve Manufacturing Company.

The Clambake

The New England clambake brought all delegates and guests back to the Industrial Arts Building for the evening. Food for the bake, for the most part, was cooked out-of-doors over heated rocks, as is customary for such an event, and then served within the building where each delegate and guest was supplied with a white cotton apron and a towel to expedite the satisfactory handling of it. The menu included clams, clam broth, chicken, fish, Irish potatoes, sweet potatoes, lobster, white bread, brown bread, butter, coffee, pickles, tomatoes, corn and watermelon. This repast, together with the conviviality of the occasion, will be long remembered by those present.

It was during this evening of festivity that William H. Flood, President of the Springfield Chamber of Commerce, welcomed everyone. He called attention to the part that each should play in protecting the future of America by clarifying thought and quieting the minds of those in their respective communities who might have become distraught over unsettled conditions. Mr. Flood also advised that never before had the Eastern States Exposition grounds been used for a convention and in this connection he complimented unstintingly the Convention Division of the Chamber of Commerce and Adrian L. Potter, its secretary, for the work being done.

Further words of welcome were presented by the Honorable Henry Martens, Mayor of Springfield. There also were greetings of James R. Dearden, member of the West Springfield Board of Selectmen.

Response for the Association was made by H. H. Harrison of The Crystal Tissue Company.

The evening was concluded with the presentation of the Muirhead golf trophy, the other golf prizes, and with entertainment and dancing.

Formal Opening of Convention

The morning of the second day of the convention, June 24, was given over to viewing the exhibits and to a general meeting. W. Gordon Booth of the Robert Gair Company and general chairman of the convention committee called the general meeting to order at 10:15 a. m. and immediately turned it over to Frank Timmerman, mill manager of the Northern Paper Mills and president of the association.

Mr. Timmerman called upon the Reverend John H. Nolan, Rector, St. Peter's Episcopal Church of Springfield, for the invocation, after which Robert Eminger, national secretary of the association, read the names of the association membership that had passed on since the convention of a year ago. The names of A. L. Cassie, Holyoke, Mass., and David Wallace, Horwich, England, made up the list. The reading of this list by Mr. Eminger was followed with a memorial prayer by the Reverend Nolan.

President's Message

At this point in the program, Mr. Timmerman proceeded with the presentation of the President's Message for 1937. He first of all expressed the pride that had been his in serving the association as president during the past year. Reference then was made to the upswing in business with its incident production problems; to the addition of 107 new members since the convention of a year ago; to the adoption of seven of twelve recommendations suggested in a report of the field secretary, George W. Craigie; to the development and putting into effect of a plan for including local as well as national advertisers in the Yearbook; to the effort that has been made to make the divisional meetings more constructive, to relieve divisional officers of as much work as possible, and to provide indi-

vidual members with more information than ever before; to the increased volume of advertising scheduled for the 1937 issue of the Yearbook; and to the Paper Progress Exhibit which, according to Mr. Timmerman, is the largest exhibit of its kind ever staged.

Mr. Timmerman likewise mentioned that the field secretary has been given the responsibilities of the 1938 national convention with his decisions subject to approval of a committee of three appointed by the incoming president; that a list of non-member superintendents has been prepared; that a list of books on papermaking and allied subjects has been sent to the entire membership; that the field secretary has collected information on the value of superintendents' conventions to paper mills and that this information has been used effectively in a number of instances; that the 1937 Yearbook will contain a request from the board of trustees of the association to members and guests at both national and divisional meetings to keep their rooms closed for entertainment purposes during the time scheduled for general or group meetings; that an increased appropriation was placed in the budget for stenographic service at the headquarters office; that 247 Yearbooks were sent out in February to officials in mills where the association had no members and that a number of new members were added in consequence of it; and that a start was made during the past year toward reorganizing the Southern Division.

Credit for the accomplishments of the past year was given by Mr. Timmerman to the combined efforts of many men—trustees, committees and individual members. He likewise thanked *The Paper Mill and Wood Pulp News*, as the official organ of the association, and the other trade publications for the co-operation given the association during his term of office.

In concluding his message, Mr. Timmerman expressed his thanks for the opportunity of serving as president, and requested that all join with him in pledging 100 per cent support to the Association for the coming year.

Appointment of Committees

Mr. Timmerman followed his message with an announcement covering his appointment of committees. The committees and appointees were as follows:

Nominating Committee:
Fred C. Boyce—Northwestern Division.
Fred J. Rooney—New York & Canadian Division.
Charles Champion — Connecticut Valley Division.
E. Ryland Neblett—Southeastern Division.

Resolutions Committee:
William H. Brydges.
H. H. Harrison.
Valentine Frederick.

Auditing Committee:
K. E. Terry.
J. H. O'Connell.
H. W. Sherman.

In appointing these several committees, Mr. Timmerman requested of each of them to report during the business session scheduled for the afternoon of the following day.

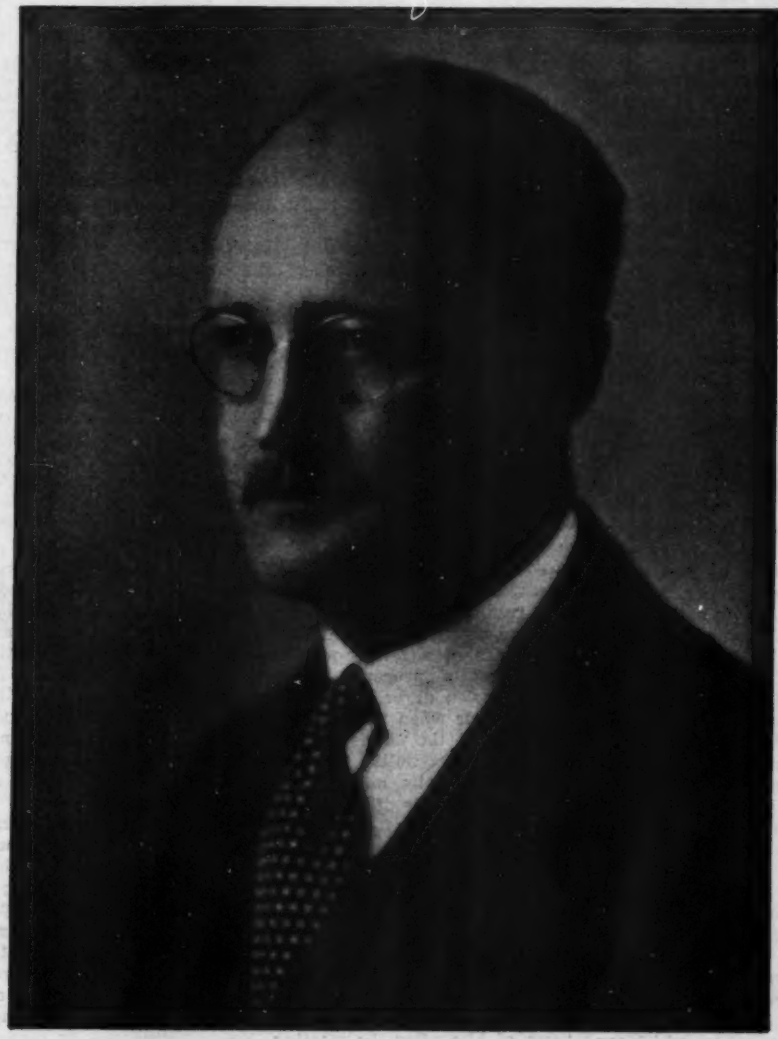
Movie on Felt Making

The remainder of the morning session of the first day of the convention was given over to the showing of a sound motion picture with Lowell Thomas as narrator on The Art of Felt Making and to a discussion in open forum of mill problems. This latter part of the meeting was in charge of John O'Connell, one of the past presidents of the association and one of the members who was present in 1923 at a previous convention of the association in Springfield.

Mr. O'Connell, in taking charge of the meeting, said that it was a pleasure to see so many No. 23's. The No. 23's referred to those present at the convention who individually were wearing a paper tag bearing the imprint No. 23. This tag was supplied to each registrant at the convention who had been to Springfield for the meeting in 1923 and its use promptly identified the wearer with that convention.

The sound movie on The Art of Felt Making, dedicated to the pulp and paper industry of America and presented by the Albany Felt Company, was produced by William J. Ganz Company. It covered the making of felts from the shearing of the sheep to the shipment of the finished products. Only the cream of the crop of fleeces, it was pointed out, are accepted for shipment to Albany. It likewise evidenced that there are three or four different grades of wool in a single fleece; that the length of fiber in wool varies greatly; and that every felt has its own pedigree.

Emphasis was placed on the care exercised in sorting and in scouring the wool as well as in the other major processing operations that follow. Scientific control was in evidence at all times. The importance of tempera-



B. D. Millidge, the Association's new president

ture and relative humidity control in the drying of the scoured wool was stressed. Blending of the wool, it was disclosed, is regulated by the designing department. Both mule and continuous ring spinning machines were shown.

The movie also revealed that more than 2,000 styles of felts and jackets are made in the plant of the Albany Felt Company in the course of a year; that over 700 miles of yarn is required for some pick-up felts; that a felt generally is woven twice as wide as its finished width; and that a problem every other business day, on the average, is submitted to the company by the pulp and paper industry. Stenciled names and addresses of a number of customers were reproduced from burlap wrappers of typical felt shipments as the concluding feature of the movie.

Felt Problems Discussed

Nearly all of the discussion in open forum that followed the movie presentation was confined to the subject of felts.

One superintendent rather jokingly recalled an incident of his experience in which a hole, about the size of a man's hand, had been burned accidentally into a felt and that this hole was repaired by him, making the felt as good as ever, after the repair job had been turned down by the felt manufacturer as being impractical.

Another superintendent queried if there was a felt washing solution that could be used to prevent a felt from becoming hard when water is on the alkaline side. In answering this question, a representative of the Albany Felt Company, who took an active part in the discussion period, suggested that a muriatic acid solution was often best for such a purpose if lime was causing the trouble. He said that the solution of the problem depends on what is in the felt, suggested that the laboratory would be pleased to make recommendations for overcoming the condition, commented that a tacky condition might be due to insufficient lather during a wash-up, and intimated that hardness may be due to iron. He further stated, when questioned as to the strength of muriatic acid solution to use, that a 10 per cent solution was most commonly employed.

In answering other questions, he remarked that there are a number of soap chips and washing compounds which are good but there are others which are not so good; that experience has shown it best to allow the laboratory to analyze a sample of dirty felt and to make recommendation; that acid usually is recommended when felt is filled with lime or iron; that felt is sometimes washed with acid first, then rinsed, and finally soap washed; and that again acid washing is sufficient.

Another superintendent made inquiry as to recommended practice for wetting out a new felt to get a better surface. Flat wetting out was recommended although it was stated that the operation was done sometimes by roping. Warm water was said to be better for this purpose than cold. It likewise was stated that wetting out agents are sometimes good.

The shrinking in and the widening out of felts was another problem touched upon. Sizing was suggested as a possible cause of the trouble, but another superintendent said that he had similar difficulty in a mill where there is no change in sizing procedure and that spread rolls have had to be used to overcome the difficulty. The trouble seems to be experienced by some mills during the summer and in other mills during the winter.

Further emphasis was placed upon the proper wetting out of a felt at the time of start-up. One superintendent commented that in experimenting on six felts with wetting out agents he found the felts to hold their shape better and that the stripes run truer. Improper wetting out of felts, continued another superintendent, has a tendency to cause felt wrinkles.

Other points brought out in the discussion included the turning over of felts sometimes to keep them cleaner; the use of kerosene, gasolene and naptha for removing grease spots from felts —best application being made before felts are wet; and the more frequent use of ethylene dichloride for a similar purpose in the felt mill. It also was stated that shorter nap helps to keep down fibers; that certain customers require their felts to be vacuum cleaned before shipment; that trouble with wool fibers getting into paper is overcome in some instances by wiping sheet with a wool and cheesecloth wrapped 2 in. x 4 in. just previous to calender; that most trouble with loose fibers is when felts are new; that the middle portion of the life of a felt shows less loose fiber; that a properly finished and singed woolen dryer felt does not give much trouble when new—there is more trouble when the felt is old; that a device something similar to old type reel is being used by one superintendent on the bottom side of the sheet to clean the under surface of the sheet previous to calendering; and that the drainage of a new felt wetted out with a felt wettener is as good in five minutes as formerly without the wettener in two or three hours.

One of the superintendents who had been very active in the discussion promised to supply the names of several wetting out agents to anyone who requested them of him after the meeting.

Toronto—The Convention City for 1938

After a very brief discussion on possible causes of wavy board, Mr. Eminger announced that the 1938 convention would be held at the Royal York Hotel, Toronto, Ontario. This meeting will be the first annual convention of the American Pulp and Paper Mill Superintendents Association to be held out of the United States. The dates set for the convention are June 22, 23 and 24, 1938.

Mr. Eminger also commented on the illness of H. S. Shellington, formerly superintendent of the West Jersey Paper Company and a member of the association and read a letter from Mrs. Shellington, in which she stated that her husband enjoys *The Paper Mill*, and asked to be remembered to all of his friends.

Mr. Timmerman brought the morning session of June 24 to a close, he having taken over the meeting from Mr. O'Connell following the open forum, by announcing the group meetings of the afternoon and by thanking the Albany Felt Company for the movie as well as for the active part taken by one of its representatives in the discussion.

Mr. Whiting Speaks

The luncheon speaker of the day was Edward E. Whiting of *The Boston Herald*. Following an introduction by James B. Ramage, treasurer and general manager, Franklin Paper Company, in which some of his many accomplishments were mentioned, Mr. Whiting quickly launched into his subject, *Who Loves Business*, with only a few introductory remarks relative to efficiency and politics. He called attention to the bewildering change that has been taking place between government and business, said that some of these changes had been rapid and radical, and expressed his faith in our form of government because of its inefficiency which, in his opinion, was in accord with human nature and could be understood.

Mr. Whiting showed that there was nothing new in politics by reading two reviling editorials about former presidents, one about George Washington, the other about Theodore Roosevelt. The Roosevelt editorial appeared in the January 2, 1912, issue of the *New York World*. He mentioned the economic crisis which took form toward the end of the Hoover administration and related that President Roosevelt had tried some strange things, some of which were good and some not so good.

In the opinion of Mr. Whiting, the question is still unanswered as to whether the government will take a greater hand in business. He likewise stated that there is nothing new in collective bargaining and suggested that there is nothing particularly menacing on the political horizon. It is not likely, he continued, that President Roosevelt will run for a third term.

The theory of our government, concluded Mr. Whiting, is that we shall be governed by ourselves.

These remarks, together with a few words of appreciation by Mr. Timmerman in behalf of the association, completed the luncheon meeting.

Six Group Meetings Scheduled

It was followed shortly afterward with six group meetings that were held simultaneously and which took up the rest of the afternoon. There was a group meeting on book and fine writing, on board, on sulphate and soda pulp, on sulphite pulp, on tissue, and on groundwood. The book and fine writing meeting was presided over by Charles Champion; the board meeting by John H.

Brougham; the sulphate and soda pulp meeting by John McCrystle; the sulphite meeting by Morris W. Hedden; the tissue meeting by H. H. Harrison; and the groundwood meeting by Sidney D. Wells.

Drying of Sized Paper

Three papers were scheduled for presentation before the book and fine writing meeting.

The first of these papers was entitled *Evolution of Sized Paper Drying* and was the subject of F. W. Partsch of the J. O. Ross Engineering Company. Mr. Partsch stated, in part, that the original system, and one which is by no means totally out of favor, is to size at the end of the paper machine, and slit, cut and lay in stacks; that the stacks are taken to the pole loft where the sheets are hung in spurs of from four to twenty-five sheets; that these spurs are hung over loft poles and allowed to dry, in some cases overnight and in others as long as four days; and that temperature as high as 180 degrees Fahrenheit has been used in a pole loft, control being obtained by hand valves.

The first forward step, continued Mr. Partsch, was the introduction of a forced circulating system in which a fan and heaters were employed to distribute the air, air washers and temperature and humidity control apparatus being incorporated in the system to retard the fast drying. This development, he said, was followed by drying in the web as in the spur or slat dryer, then by the Barbour dryer and later by the festoon dryer. He pointed out that the festoon system of drying had been used in connection with coated papers for half a century or more but that it was new up to that time for sized papers. Various different arrangements of festoons, with preliminary dryers, preheaters ahead of the preliminary dryer, conditioning systems after the festoons, even straight pass dryers, he said, have been and still are being used in this field.

Reference was made to the tension controlled Barbour loft that was offered to the trade a few years ago, it being stated that installations of this type have been made which vary in length from one holding 300 feet of paper to one holding 800 feet of paper and in speed from 75 feet per minute to 250 feet per minute.

Mr. Partsch further commented that the air system now used with the Barbour dryer has an independent unit for each section; that each unit has controlled temperature; that fresh air is introduced through filters to the dry end section; that return air is drawn from the dry end section by the next unit and delivered to its section, and so on through the entire length of the dryer; and that an exhaust fan at the wet end discharges the moist air to the atmosphere, or, if desired, this air may be distributed to the finishing room or other parts of the mill where humidity is required.

The modernized arrangement of the festoon system of drying sized paper, one that eliminates all stick marks, said Mr. Partsch, makes use of a tension controlled Barbour loft ahead of and in series with it. Mr. Partsch also cited a Spar dryer installation that was made within the past few years in which the dryer is totally enclosed and is equipped for forced air circulation and temperature control. This type of dryer, he inferred, would be of little interest to manufacturers of light weight papers but is very satisfactory for heavier papers.

Mr. Partsch brought out in his concluding remarks that starch sized papers have been dried in the laboratory at temperatures as high as 450 degrees Fahrenheit; that the temperature on some grades of paper should be kept as low as 100 degrees Fahrenheit;

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Retiring President

and that humidity control may very soon become more generally accepted as an aid to better drying of sized papers of certain grades.

New Beater Described

The second paper scheduled for presentation before the book and fine writing meeting, a paper entitled *The Jones-Bertrams Patent Beater*, was the subject of George H. Spencer of E. D. Jones & Sons Company. Mr. Spencer said in part that stock preparation will always be an important operation in the manufacture of paper; that the ordinary Hollander beater is an exceedingly adaptable machine; that many modifications of the Hollander beater have been constructed in a somewhat haphazard fashion; that the Bertrams Patent Beater, which originated in Edinburgh, Scotland, and is now being made in the United States under license-agreement with Bertrams, Ltd., has had sufficient commercial success in Europe and elsewhere to predict that many existing Hollanders in the United States ultimately will be replaced by it; and that the Jones-Bertrams Patent Beater is its American counterpart.

With this introduction, Mr. Spencer proceeded to describe the Jones-Bertrams Patent Beater. He stated that the bedplates of this beater, of which there are three, commence about at a line drawn vertically downward from the center of the roll and ends at about 15 degrees below a horizontal line through the roll center; that an actual contact of about 75 degrees is maintained at all times between the roll and bedplates; that the roll discharges all of the pulp it gets; that an adjustable apron is located in front of the roll to regulate the quantity of pulp flowing to it; that the speed of the stock on its travel down the back channel is increased by making the back channel narrower than the front or wall side; that the shaping of the tub ends, arrived at after much experimentation, is secured by taking each end of the midfeather as a center and describing an arc about it to a point where a tangent from the front side of the trough meets the arc; that the beating power of the Jones-Bertrams Patent Beater is three to four times that of an ordinary Hollander; that roll weight of any beater should have sufficient inertia to insure smooth action (a 60 inch diameter by 53 inch face roll on a 1,000 lb. Jones-Bertrams Patent Beater that was mentioned weighed 24,000 lb.); that the roll of the Jones-Bertrams Patent Beater, mounted on SKF roller bearings, is supported at the end of a pivoted cantilever arm in such a manner that its line of travel permits the roll to equally engage the bedplates at all times regardless of the amount of roll or bedplate bar wear; that the opposite end of the cantilever arm connects with levers which carry a heavy cross-shaft and through this arrangement the front and rear lighters move in unison; and that there is a choice of two automatic controls—the Milne automatic roll lowering gear and the Stamets-Duckworth automatic electric control.

The Milne automatic roll lowering gear was described as an apparatus consisting of cone pulleys driven from the beater spindle with suitable gearing to gradually move a predetermined weight so that the pressure of the roll on the bedplates may start at zero and be brought up to a maximum of 100 per cent of the total available weight of the roll in any given time and to automatically disconnect itself when any given pressure on the bedplates are reached.

In the Stamets-Duckworth automatic control, said Mr. Spencer, a small motor is geared to the hoist mechanism which is located on the front lighter only and, at the same time, is connected electrically to the main motor driving the beater. This apparatus, continued Mr. Spencer, controls the beating cycle by maintaining a pre-determined load on the main driving motor and as the beating cycle progresses the roll is lowered automatically to the bedplates to maintain this pre-determined load.

Repetition of beating cycles, emphasized Mr. Spencer, is possible with either of the two controls.

Another apparatus for duplicating beating cycles that was mentioned by Mr. Spencer in his concluding remarks was that of Taylor Instrument Com-

panies. This apparatus, he said, which still requires manual operation of the hoist mechanism, records on a twenty-four hour chart the actual pressure of the roll on the bedplate irrespective of the condition of the roll or bedplate bars.

Separating Dirt from Paper Stock

The third and last paper on the program of the book and fine writing meeting was entitled *Meeting Today's Standards of Paper Cleanness* and was presented by F. K. Becker, Bird Machine Company. To deliver the maximum volume of clean, uniform stock to the paper machine wire, said Mr. Becker, your screens must have sufficient total slot area to permit the use of gentle screening forces and fine cut plates. In the modern screen, he continued, both the heavy and light dirt rejected by the screen plates is quickly concentrated where there is no screening action so that there is virtually no opportunity for this dirt to pass through with the screened stock—the heavy dirt being discharged at the bottom of the screen, the light particles floating into a quiet area at the discharge end of the screen between the vat and the cylinder and from which they are discharged over adjustable gates into overflow compartments leading to the tailing system. An extra wide shower pan, made possible by the larger cylinder diameters now used, commented Mr. Becker, catches 85 per cent or more of the shower water so that it is removed from the system without getting into the stock at all.

Some mills, he continued, are using plates as fine as .008 in. in new screens where .012 inches or coarser had been used with earlier models. He said that in one such case, running at 450 feet a minute and with .008 in. cut plates, there is better than a 33 per cent reduction in dirt count as well as much improved sheet formation. Other cases cited were as follows: a sulphite bond mill that had two No. 2 screens with .016 inch plates handling about 4,000 lb. an hour replaced them with two 3A screens fitted with .010 in. plates and thereby reduced dirt count 50 per cent; another mill making book paper changed from screens with .014 in. plates to larger screens with .010 in. plates and reduced surface specks from 18 to 20 to 9 to 10; and that one mill that recently put in four big screens figures that it is getting 10 per cent more production as well as a cleaner paper because of the steady production of No. 1 paper they made possible.

Mr. Becker also made reference to the separation of dirt according to its specific gravity rather than according to size. In this connection, he said that some kind of dirt will always get by the screens but not the Centrifiners and vice versa; that in the latest type of centrifugal dirt separation the cleaning area is increased tremendously by employing three different centrifugal baskets, each of which employ a different centrifugal force; that an installation of Centrifiners in one fine mill making a 50 per cent rag, 24 lb. ledger, reduced the dirt count 87 per cent; that a 50 per cent rag blue print paper from the same mill had its dirt count reduced by 84 per cent; that in another mill the percentage of No. 1 sheets was increased from 55 to 97 per cent; in another from 75 to 85 per cent; and in still another it was possible to reduce the furnish for each run by about 10 per cent because of the low percentage of rejects.

Novel Presentation on Board Making

The program of the board meeting included the presentation of four papers.

The first of these papers, *Making Board-From Stock Pile to Finishing Room*, was the subject of Allan Hyer and John Hamm of the Black-Clawson Company and Shartle Brothers Machine Co. respectively, the presentation being made in the form of extemporaneous dialogue and diagrammatic sketches being used for purpose of illustration.

After a few introductory remarks by Mr. Hyer in which he explained the procedure to be followed, Mr. Hamm, figuratively speaking, put the raw stock and old papers into a breaker beater, commenting that old papers seem to be getting worse very fast, and proceeded to extract continuously and to remove the junk.

Mr. Hamm commented that a consistency of two and a half per cent is about right for a breaker beater, and then referred to the pumping and dilution of the stock previous to settling sand particles, glass, pins, etc., from it and to further disintegration of the stock by passing it through a Classifier or some other machine.

The good stock from this disintegration, said Mr. Hamm, is taken over a flat screen or by-passed to a thickener, the rejects being further treated and then screened on the same flat screen as used for the accepted stock. A chest with a midfeather and a fast-sloping bottom, together with a low head impact impeller pump arrangement then was described by Mr. Hamm for the circulation and storage of the accepted stock.

At this point, Mr. Hyer inquired as to how well the stock had been cleaned and was informed that a good job had been done, so good, in fact, that in one mill where some experimenting is being done with the system, an attempt is to be made to take the machine screens on filler stock off the machine.

Another system, continued Mr. Hamm, built up around the use of a tub-type pulper, is being worked on for liner stock. Referring again to a diagram, Mr. Hamm described the operating characteristics of the pulper and the method of feeding. He stated that the pulper was made in four sizes; that the tub is calibrated for certain consistency; that the pulper can be dumped as an ordinary beater, only much faster, or stock can be pumped from it to a chest; and that a hydrating element can be attached to the pulper, the stock in such a case going directly to the beater chest and from there through regular procedure to the jordan and then to the machine chest.

A further question from Mr. Hyer prompted Mr. Hamm to state that stock will form up better on the mould with this type of treatment and that longer stock can be run on the machine.

Mr. Hamm called upon Mr. Hyer to take the stock from where he had left it and to make some paper out of it.

Mr. Hyer advocated the use of the direct flow vat, large diameter cylinder moulds—not less than 48 inches being the usual recommendation and up to 60 inches in cases where high speed is important, and suction presses. He said the new type of vat improved formation which made for easier water removal and better finish; suggested the use of seven, eight, or nine vats for heavy weight board; and mentioned another design of vat which could be worked either in the conventional way or with direct flow. Mr. Hyer concluded his remarks with a reference to vertical dryers, stating that they are now being built with intermediate rolls at tops and bottoms of columns to eliminate the long draws that have been troublesome.

The discussion which followed Mr. Hyer's remarks centered largely upon the subject of bulking. One superintendent commented that in his experience he obtained a bulkier sheet by running as much stock on each cylinder mould as could be carried for good formation; and by taking this sheet off the third press as wet as possible. Another commenter remarked that a bulky sheet would be obtained by extracting all free water with a suction roll not followed up by nip contact pressure. The more a sheet is compacted, he continued, the greater the density of the sheet.

Reducing Board Mill Power Costs

The second paper on the program of the board meeting, a paper entitled *Steam for Board Mills*, was the subject of Samuel Blum of H. M. Wilson Company. Mr. Blum set up technical data on a hypothetical plant, suggested that the desire was to reduce steam requirements and at the same time secure greater electrical output; proceeded to accomplish what was desired by superimposing a high pressure boiler and turbine installation on the existing equipment; gave the reasoning involved in making the selection of equipment; and presented comparative operating cost figures showing a return of about 17 per cent on investment required to make the change over. The Container Corporation plant in Philadelphia was cited by Mr. Blum as a specific case where the saving in power and steam amounted to $104,000 a year, or 76c per ton of product. He also mentioned that a boiler producing 100,000 lb. of steam at 600 lb.—150 degrees superheat is being completed at the Container Corporation plant in Carthage, Indiana; that the entire output of this boiler will be passed through a 1,500 kw. turbine

to be operated in parallel with an existing bleeder condensing unit; that the new machine will exhaust at 170 lb. to be used for existing drives and for operating the present turbines; that The Ohio Boxboard mill at Rittman, Ohio, has just placed in service a 120,000 lb. unit to operate at 450 lb.—150 degree superheat; that the pressure on an existing turbine has been increased to 400 lb. and a second high pressure boiler and back pressure turbine are contemplated; that at the W. C. Hamilton Plant, Miquon, Pennsylvania, a 400 lb. pressure boiler was installed and the existing 1,500 kw. generator provided with a new bleeder condenser turbine to receive this higher pressure; that in 1931 two 1200 hp. boilers operating at 350 lb. pressure were installed and the existing turbine converted for the higher pressure in the P. H. Glatfelter plant at Spring Grove, Pennsylvania; and that the McDowell Paper Mills Company, Philadelphia, when recently confronted with the necessity for new boilers, installed a 60,000 lb. unit designed for 450 lb. pressure turbine to "top" the existing equipment.

Flotation Type Save-All Described

F. Myers of Stockholm, Sweden, presented the third paper of the board group meeting. The title of his paper was *The Svenn Pederson Flotation Save-All.*

Kraft Liner Board Fourdrinier Improvements

The last of the four papers scheduled for the board meeting was a paper by R. S. Johnston of the Pusey & Jones Corporation on *Improvements Incorporated in the Latest and Largest Fourdrinier Kraft Liner Board Machine.* In this paper, which was presented, along with a motion picture, by Samuel M. Bratton, Mr. Johnston cited the tremendous development now taking place in the kraft industry of the South; suggested that only a few years ago cheap wrapping, bag, carton, and container products were manufactured on small slow speed machines, but that today they are being made on the widest machines of most modern design and construction, machines attaining such manufacturing speeds as approximately 1250 feet per minute on bag and wrapping, 1000 feet on .009 liner and 650 feet on .016 liner; intimated that such high manufacturing speeds are possible only on the fourdrinier type of wet end which also permits forming a sheet of the required caliper and test but containing less material by weight; referred to the products manufactured by the West Virginia Pulp & Paper Company; and then proceeded to describe the paper machine installed in the new mill of this company in the South.

The initial production of this machine when manufacturing .016 liner, said Mr. Johnston, is expected to average not less than 400 tons per day with a possibility of considerably increasing this tonnage later by the installation of additional drying capacity.

The general arrangement of the machine, continued Mr. Johnston, comprises fourdrinier part, suitable for a wire 242 inches wide by 93 feet long, equipped with 40 in. diameter suction couch roll, 10 suction boxes, adjustable shake and quick-handling wire installation device; press part with two 38 inch diameter suction presses and a feltless third press (smoothing rolls); dry part consisting of four sections of twenty 60-inch diameter dryers in each section and with provision in building construction for later installation of an additional section of twenty dryers; two stacks of calenders; Pope reel; Cameron winder and an auxiliary four drum Moore & White rewinder for running off special shipping rolls.

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Mr. Johnston also stated that the machine sections will be driven by Westinghouse individual motors which will provide a speed range for the machine of 350 to 1400 feet per minute; that antifriction bearings are used throughout the machine with the exception of calender stacks; that the flow box is of two-compartment design with additional intake compartment connected to stock piping; that a large perforated motor-driven roll is provided in the flow space just ahead of the apron to serve as a current breaker and stock distributor; that construction of the flow box consists of light steel plate, stainless clad on the inside, supported on a rigid structural steel framework with wood partitions and baffles; that the slice is of combination type (a straight slice 60 inches high with adjustable lip located directly over breast roll, a second adjustable lip slice 24 inches high immediately following, and a plain straight slice about 12 inches high following the second slice) suitable for running on various grades of liner from .009 to .030 or heavier; that the suction boxes are connected to a special mechanism giving a combination crosswise and lengthwise movement; that every precaution was taken in the construction of the wet end section to protect all exposed parts against corrosion and at the same time to insure necessary strength and rigidity combined with lightness in weight of all running and shaking parts; that return wire rolls and press felt carrying rolls are made of light steel tubing covered with Monel metal by a special welding process; that practically all attachments on the fourdrinier and press sections have been brought under remote control of the push button; that many improvements have been made mechanically in the dryer section; that each drying cylinder weighs as much as 12 tons; that a valuable improvement toward increasing the drying capacity has been incorporated in the machine by increasing the spacing between the dryers; that an oil filled dash pot device, installed on each side of the Pope reel and connected at one end to the upper part of the arms supporting the roll core and on the other end to the sill plates, effectively checks any tendency of a roll to bounce during the winding operation; that a pneumatic loading system is used on the main press rolls to insure greater accuracy in the adjusting and maintaining of pressure; and that an improvement in the design and construction of the enclosed gear drive arrangement of the dryer section provides a much more compact arrangement of framing with greater accessibility and improved ventilation and control of air circulation.

In concluding his remarks, Mr. Johnston referred to the recent ordering of the first newsprint machine for installation in the South and commented that it is freely predicted that a similar development to that of the kraft industry is under way for newsprint—a development which will eventually make the South dominant in newsprint production not only in the tonnage turned out, but also in the machine units capable of higher manufacturing speeds than those in use in any other locality.

Kraft Brown Stock Washing

The first of three papers on the program of the sulphate and soda meeting was a paper by C. Fuhrmeister of Oliver United Filters, Inc., on *Modern Method of Washing Kraft Brown Stock.*

Mention was made by Mr. Fuhrmeister that vacuum pulp washers installed in series are being used successfully in widely separated parts of the continent for chemical pulp washing; that hemlock, Oregon pine, spruce, balsam and southern pine pulps are being washed in this manner with resultant low chemical loss, high gravity liquor to evaporators and with previous foam difficulties eliminated; and that washing on vacuum filters installed in series involves both displacement and dilution due to repulping between successive stages. With the present system, remarked Mr. Fuhrmeister, a cook is washed completely in less than one hour.

Mr. Fuhrmeister cited the problem of foam handling when washing kraft pulp, particularly that made from southern pine, with vacuum washers; stated that

foam is formed by mixing air with liquor; and suggested that the primary source of foam was at the old style washer.

He added that the present type of washer is free from restrictions and right angle turns; that air is drawn off at the top of the trunnion outlet by means of a rotary type vacuum pump; that liquor is drained out of the bottom trunnion outlet and finds its way to liquor storage by means of a gravity leg (not a barometric leg); that another cause of foam was the improper application of wash liquor; that the temperature of wash liquor must be closely controlled; that foaming was also caused by the improper repulping of the pulp between the various stages; that the only fresh water entering the system is that applied on the final stage washer; that a liquor storage tank is provided for each stage; and that the system is countercurrent.

Among the advantages for the system that were set up by Mr. Fuhrmeister were the following: higher capacities per unit area, no foam losses, dilution of black liquor in wash room only 3 to 4 deg. Be., chemical loss in wash room reduced to as low as 25 lb. or to a conservative maximum of 75 lb. of Na_2SO_4 per ton a. d. pulp, complete sharp separation of fibers from liquor, uniform operating results and operation always visible, one operator takes care of wash room, power requirements for entire wash room less than 1½ h. p. per ton of pulp washed, and total cost of wash room including building and equipment ready to run approximately $650 per ton of pulp at rated mill capacity.

Alkaline Pulping Chemical Losses Analyzed

Factors in Chemical Losses in Alkaline Pulping was the title of the second paper on the program of the sulphate and soda meeting. It was the subject of G. A. Day of the Brown Corporation who stated, in part, that the sources of loss from any alkaline pulp mill fall into two groups: Unnecessary losses—loss during blow, evaporator loss, and leaks and overflows—necessary losses—pulp washing, sludge burning, lime reburning, furnace losses and cleaning tanks, evaporators, etc.; that proper sewer measurements, with continuous sampling, and an alert operating crew which is "liquor conscious" will go far toward eliminating the unnecessary losses; that the stock as it comes from the digester contains considerable quantities of soda absorbed on the fiber which does not appear from tests done on the liquid; that the quantity of soda present in this form depends on such factors as cooking conditions, strength of liquor, and method of washing; that statements as to washing losses nearly always neglect this factor and in consequence are about twenty pounds per ton lower than actual; that a mill using lime at the rate of 400 lb. per ton would discharge nearly 700 lb. of dry sludge per ton, corresponding to a loss of about 13 lb. of salt cake per ton, in an insoluble form; that it would be interesting if some of the mills, which are re-burning sludge, would present information as to kiln losses by determining the ratio of CaO to Na_2O in and out of the kiln, so that the order of magnitude of soda loss in calcining could be determined; that stack loss from the recovery system is the most serious source of loss in the mill; that spray types of recovery furnaces are blamed frequently for seriously increasing the amount of furnace loss; that the bulk of stack loss is not due to physical entrainment but must be the result of a process of sublimation or volatilization; that the presence of steam causes a considerable increase in the volitilization of sodium carbonate, and the reducing action of hydrogen increases the sublimation loss to a marked degree; that from point of view of minimizing furnace losses, the temperature should be low, the char burned should be dry, the time of exposure of the smelt to high temperature should be minimum and the charge should not be swept with large volumes of gas when at high temperatures; that when soda recovery is made in a furnace in which the soda is removed in molten form, it is necessary to operate furnace at a higher temperature level than a kraft smelter due to the higher melting point of the smelt; that clean black liquor without sludge or fiber will help to keep evaporators clean; and that good circulation in the smelter dissolving tanks tends to prevent accumulation of sludge.

Kraft Industry Reviewed

The last paper on the program of sulphate and soda pulp meeting was one by Dr. C. A. Brautlecht of the University of Maine on *Progress in Kraft Pulp Production*. In this paper, Dr. Brautlecht stated that the kraft pulp process was first employed by Dahl in 1884 in Danzig, Germany; that despite the unpleasant odors of the mercaptans (sulphur alcohols) in the waste and relief gas, the kraft pulp industry developed in Europe quite rapidly, particularly in Sweden; that the first kraft pulp mill in North America was operated by the Brompton Pulp & Paper Co. in 1907 at East Angus, Que.; that over ten per cent of the kraft pulp produced is now being bleached and this percentage will probably increase rapidly; that at present about one-third of the wood used is yellow pine, the other two-thirds being made up of tamarack, spruce, hemlock, jack pine, white pine and saw mill waste; that there is evidence to show that slash pine will grow to pulpwood size in the South in 20 to 25 years, especially on former cotton land, and can be delivered at $5.00 per cord at the mill; that other raw materials used in quantity can be obtained locally or at low cost in the South; that some of the older kraft mills in relatively poor locations or in locations that have become undesirable will cease to exist (cited closing of Continental Bag & Paper Co. unit in Rumford, Me., and Union Bag & Paper Co. mill in Kankauna, Wis.); that Huron Forest Products, Ltd., plans to build a new mill in Canada to cost $3,000,000; that the Brown Company plans increased production at La Tuque; and that recent increase in facilities at Ostrand, Sweden, doubling in capacity of kraft pulp production in Finland, and increase, especially of bleached kraft, in Germany are marked advances.

New production facilities in the South were related by Dr. Brautlecht. Among the projects mentioned were those of the International Paper Co., Champion Paper & Fibre Co.; Union Bag & Paper Corp.; Kiechefer Container Co.; National Container Corp.; Container Corp. of America, and Crossett Lumber Co. Reference likewise was made to a number of contemplated projects.

Dr. Brautlecht also called attention to some of the more important uses for kraft fiber; suggested that a reduction in imports and some increase in exports can be expected in the not distant future, and that the major improvements during the past decade in kraft pulp manufacture have involved more efficient heat utilization in cooking and chemical recovery, improvements in equipment to reduce maintenance and shut-downs, replacement of batch by continuous process in causticizing, water cooled walled in furnaces, better washing, use of recovered carbonate of lime in making sulphite acid, condensation of blow-off and relief gas to recover turpentine and cymene as well as to effect heat exchange and reduce mercaptan escaping into the air, more indirect cooking with pump circulation and introduction of more efficient multiple effect vacuum evaporators for black liquor.

Sulphite Bleach Plant Design Factors

The program of the sulphite group meeting included three papers. The first of these papers, a paper entitled *Designing a Plant for Bleaching Sulphite Pulp*, was a dissertation by W. L. Savell of The Mathieson Alkali Works (Inc.).

Mr. Savell pointed out at the outset that the bleaching of sulphite pulp is essentially a simple operation from the standpoint of chemical processing and plant design; that in its simplest form the process involves only two operations —mixing and separation; that the chemical reagents involved are chlorine, alkali, and calcium hypochlorite; that bleach capacity required, chemical and physical properties of pulp, and properties desired in finished pulp are the factors involved in the choice of process; and that chemical properties of pulp water mixtures, physical properties of pulp water mixtures, chemical properties of reagents, and physical properties of reagents are the limiting elements affecting materials of construction, while bleach plant capacity, physical condition of pulp, consistency of pulp at a given stage, physical properties of pulp water mixtures, physical properties of reagents, and processing time and temperature are the limiting elements affecting unit design.

With this introduction, Mr. Savell proceeded to discuss, in some detail, the reagents, the individual factors affecting materials of construction, the factors

involved in the choice of process, and the factors affecting unit design.

He stated that dependable controls for proportioning chlorine are necessary regardless of the mode of application; that complete automatic meter control of chlorine flow becomes a practical necessity with continuous chlorination; that hydrated lime in the form of milk-of-lime suspension is the most widely applied alkali; that it is not unusual to treat pulp with a solution of caustic soda after the washing which follows chlorination if high alpha cellulose pulp of high white color is being produced; that the only chemical consideration required in handling slush pulp is the avoidance of contact with soluble or easily corrodable materials of construction; that rough surfaces in contact with moving pulp not only create a tendency to cause dead spots, but also cause a serious power loss because of increased friction; that the majority of pulp chlorinators are either constructed wholly of acid resistant material such as vitrified tile or are lined with tile; that rubber lined pumps, piping fittings and rubber covered washers are generally used for handling chlorinated pulp in the acid condition; that all agitating equipment in the pulp chlorinators should be rubber covered; that chemical lead pipe is used to deliver chlorine directly to pulp water suspensions; that calcium hypochlorite solutions rapidly destroy wood and seriously corrode iron; that where calcium hypochlorite is used in the bleaching equipment, the chest is generally constructed of tile lined concrete or vitrified tile; that liquid chlorine should always be conveyed in metal lines (iron or copper) and should never be passed through rubber lined or hard rubber piping; that it is generally advisable to use a single stage process where conditions require the bleaching of less than 25 tons of pulp per day; that in bleaching 25 to 50 tons of pulp per day the saving resulting from reduced chlorine consumption is sufficiently important to justify an accurate estimate of costs on the installation of a multi-stage process; that a plant bleaching 50 tons of pulp per day at 7 per cent chlorine demand may realize a saving in chlorine consumption amounting to over 300 tons per year; that the question arises, if a decision is reached to use a multi-stage process, as to whether the pulp should be washed in the acid state after chlorinating or should alkali be added to neutralize all the acid formed and the pulp washed in an alkaline condition; that the figures will quickly show, if caustic soda is to be used or large tonnage are to be bleached, that the pulp should be washed in the acid condition; and that the increased cost of acid-proof equipment may not be justified for small tonnages where lime is used as the alkali.

In commenting upon the chemical and physical properties of the unbleached pulp and upon the properties desired in the bleached pulp, Mr. Savell related that pulps having a higher chlorine demand not only show economies when bleached by the multi-stage processes, but will generally be brought to a standard color with less degradation; that dirt specks occasioned by the presence of bark particles or knot residues are more completely removed when the pulp is bleached by a single stage treatment; that in some cases the application of the bleach liquor at high pulp consistencies in the second stage will assist materially in reducing the dirt count; that high consistency bleaching with constant agitation induces some hydration of the pulp; that treatment with caustic soda

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Field Secretary

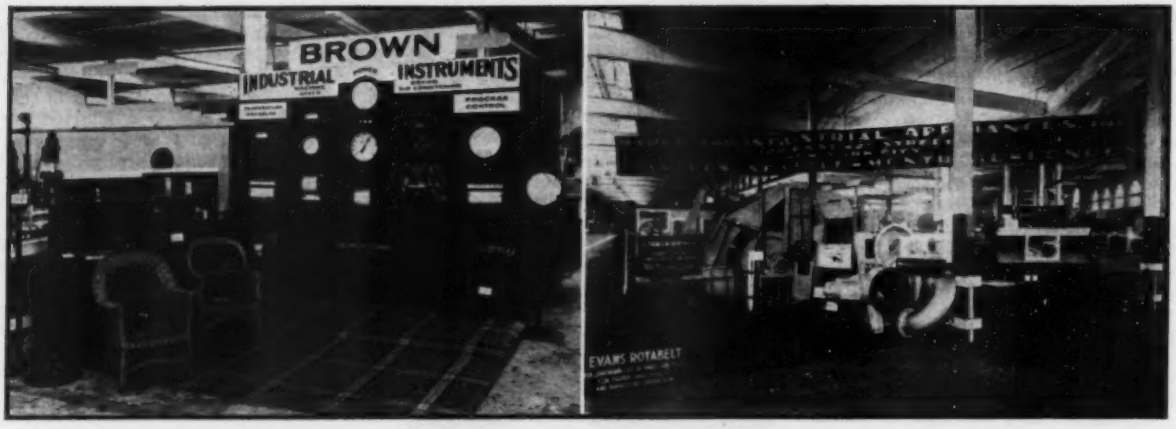
is especially desirable for pulps to be finished with a high alpha content; that lime should be used on pulps which are to have a high hydrating value when finished to bring them to a slightly alkaline condition after washing; that superior strength characteristics have been claimed for pulp treated in the first stage with hypochlorous acid; that certain mills producing large tonnages of uniform pulp and bleaching to a standard color have adopted continuous bleaching processes; that continuous single stage bleaching has been done for many years; that the batch process must be used where a variety of pulps must be bleached or the pulp must be finished at different degrees of whiteness; that, in batch operation, the choice lies between the single stage, two stage or three stage processes; and that flexibility is highly desirable in a batch treating system as it is an advantage to be able to supply one, two or three stages of treatment on occasion as special conditions may dictate.

Mr. Savell, in taking up the factors affecting unit design, said that any one of several standard agitated chests may be used to mix either chlorine or calcium hypochlorite solution with the pulp, if the pulp reaches the bleach plant in slush form; that, in some of the oldest bleach plants, vertical or horizontal concrete tanks with paddle agitators are used for single stage bleaching; that other plants have used a wide variety of agitating equipment including beaters and stock chests; that equipment of the same kind also has been adapted to ejector chlorination; that pulp purchased in sheet form naturally must be broken and reasonably defibered before bleaching by any process; that pulp breakers of the type suitable for the double purpose of breaking and chlorination include special breaker beaters such as the Midwest-Fulton and the Vortex beater; also pulp breakers such as the Bellmer, Tugboat Annie and the Lybeck; that in each of these pieces of apparatus the chlorine is introduced by means of an ejector; that alkali treatment is given in some cases in these breakers; that, with calcium hypochlorite as the reagent, bleaching may be done at consistencies above 10 per cent; that the Fletcher and the Wolf bleachers are typical high consistency bleachers; that high consistency bleachers also are used in two stage treatments using bleach liquor in both stages; that, in common with most processing equipment, the cost of bleaching apparatus per ton of capacity decreases as the size increases; that special units for multi-stage bleaching seldom have capacities less than 3 tons or more than 6 tons per batch; that the chlorinating reaction proceeds rapidly and is substantially complete within 20 minutes after the chlorine is mixed with the pulp; that, if lime is added to the pulp mixture before washing, an additional 10 minutes will be required for reasonable mixing; that chlorine may be added directly to a chlorinating chest having a depth of 20 ft. or over at a rate of 20 pounds per minute; that the chlorination rate, with the ejector, is dependent on the ejector size and water pressure; that the reaction rate between calcium hypochlorite and the color bodies contained in the pulp and the pulp itself is relatively slow; that optimum conditions demand that the temperature should not rise much above 105 deg. Fahr. as the degradation of pulp is greater at higher temperatures and calcium hypochlorite is converted to calcium chlorate at a measurable rate; and that, at a temperature of 105 deg. Fahr., single stage bleaching or the second stage treatment is complete in a period of 210 minutes.

The use of redwood in chlorinator construction was touched upon in the discussion which followed the presentation of Mr. Savell's paper. Such construction was said to be short lived but cheap. It also was brought out during the discussion that one hypochlorite stage would be better than two in getting rid of dirt because of the greater concentration of hypochlorite it would use.

Cooking Control for Sulphite

The second paper before the sulphite group meeting, a paper on *Instrument Control in Pulp Cooking*, was presented by Malcolm B. Hall of The Foxboro Co. The paper was confined largely to a discussion of the subject as it related



to sulphite pulping. In this connection, Mr. Hall pointed out that sulphur must flow to the burner at a uniform rate; that, if a hand valve is used in the sulphur line to set the rate of flow, the pressure ahead of this valve must be uniform; that efficient combustion depends upon a uniform rate of flow of sulphur and a constant weight of air per unit of time; that air weight varies with temperature and barometric pressure and unless it is under automatic control, combustion results may vary widely; that combustion temperature control is not important nor is it necessary if the sulphur flow is uniform and the air weight per unit of time constant; that the rate of absorption of SO_2 is a function of the gas temperature and the rate of flow of water; that acid concentration and temperature and chip conditions are the two major variables in acid cooking; and that cooking can be improved greatly by suitable control of steam flow, top relief, and digester level.

Mr. Hall then referred to the four major methods of sulphite pulp cooking —direct steaming without acid control, direct steaming with acid control, direct steaming with recirculation, and indirect steaming with recirculation and heat exchangers—and stated that in all four methods, automatic control of top relief is important; and that very definite cooking schedules can be set up and followed with assurance of consistent results if the acid conditions are under control, the digester uniformly charged, and the chips preconditioned.

At this point, Mr. Hall commented that one of the outstanding examples of complete automatic control under these conditions may be found at the Soundview Pulp Company, Everett, Washington, where twelve digesters are completely equipped with top relief control, steam flow control, and digester level recorders. He also mentioned that the Pulp Division of The Weyerhaeuser Timber Company at their Longview and Everett mills have thirteen digesters, all of which are equipped with automatic top relief control, and in addition, the digesters at Everett are equipped with level recorders and steam flow meters while those at Longview are equipped with steam flow controllers. It likewise was stated that there is automatic cooking control at Olympic Forest Products Company, Ranier Pulp & Paper Company, Grays Harbor Pulp & Paper Company, Shaffer Pulp Company, and Crown Williamette Paper Company.

Two other variables in cooking that were cited by Mr. Hall were relief pressure and steam flow. He likewise pointed out that the choice of steam flow control or temperature control is governed entirely by the type of cooking system; that temperature control is applicable only to those systems using heat exchangers; that steam flow control is applied to direct steaming and recirculating systems without heat exchangers; that a steam flow controller will help materially in a direct steaming digester where acid conditions are poor; that liquid level recorders for showing the acid level in digesters using the Chemipulp system are extremely important; and that instruments are of greatest value where a definite program of control eliminates as many variables as possible from the process.

Disc Refiner Applications

The last of the papers scheduled on the program of the sulphite group meeting was a paper by A. S. Cosler of the Bauer Bros. Co. on *Disc Refining in Connection with Pulp Processing and Reject Utilization*. In this paper, emphasis was placed upon a double disc refiner, Mr. Cosler stating that the two discs revalve in opposite directions at 900, 1200 or 1800 r.p.m.; that each disc is direct connected to its separate motor for rigidity, compactness, and efficiency; that the discs can be held at any desired micrometric adjustment from a few thousandths of an inch apart to actual contact; that disc plates are easily changed for different types of work-pulping, refining or stock preparation; that there are many patterns of plates available (a fluted or waveline plate being cited for use on soft materials or for a coarse product—a finely ribbed one for use on hard materials or for fine work); and that under ordinary conditions where the plates are running close, or within .001 in. to .002 in. of each other, the fibers trace the path of a spiral.

Mr. Cosler also recalled a disc refiner that he used 26 years ago, stating that its discs were filled with blocks of Swedish flint. The use of basalt and artificial abrasives also was mentioned.

In general, Mr. Cosler commented, it can be said that the double revolving disc machine gives high Mullen and high tensile increase per horsepower hour, little tear drop per point Mullen developed, little freeness drop per point Mullen developed, good formation at high freeness, and a possible greater porosity and bulk for same weight of sheet. It likewise was suggested by Mr. Cosler that disc refiners could be used profitably in the pre-preparation of stock in wrapping, bag or board mills where there is still some defibering to be done on the pulp as it comes from the pulp mill.

The disc machine, continued Mr. Cosler, has many uses other than stock preparation. He added that its first application was to prepare fiber from sound wood chips to make wall and insulating board and that its next use was to defiber semi-chemical cooks. Mention also was made of the use of the machine for defibering kraft knotter rejects and kraft screenings into ultimate fiber so that they can be put back into No. 1 stock. Other uses that were emphasized included the use of the machine for refining groundwood screenings, for defibering steamed Southern pine chips to make 9 point for corrugating and to defiber old paper stock on broke.

Open Forum on Tissue Problems

The tissue group meeting was confined to a discussion on felts and other problems of immediate interest to the group rather than to the presentation of formal papers. In opening the meeting, Mr. Harrison said that some of the smaller mills are still very cautious in their acceptance of the suction press; that, about the first of the year in the mill with which he is associated, a suction press, costing about $12,000 was installed on an ordinary machine trimming about 120 inches; that felt life on the machine since the installation has been increased; that production is 16 per cent more than before; that less power is used per hundred pounds of paper than with the straight press; and

that a polka dot effect may be seen in some sheets of paper if a felt is kept on too long.

Reference also was made by Mr. Harrison to the remarks of Charles G. Frampton of California Fruit Wrapping Mills, Inc., at the Grand Rapids meeting of last year about spraying metal on the defective part of a Yankee dryer to repair it and of the attempt made in his mill since then to use the same idea in closing up a crack on a dryer formed by the addition of an extension to it. Mr. Harrison stated that the finished job looked very nice but in a comparatively short time the place of the joining was scored again, probably by the doctor catching some sand.

At this point Mr. Harrison queried about dryer extensions, one superintendent stating that he had used regular cast iron rings for such a purpose but had trouble with them in heating up.

The discussion then went back to the subject of felts and suction presses—one superintendent mentioning a two weeks life on a rather heavy felt running at about 450 feet while another called attention to the use of suction presses on Harper's, stating that there are three machines in his locality so equipped.

There likewise was some discussion on flat boxes, felt conditioning, forming boards, dandy type table rolls, shower pressures, sheet formation, pitch difficulties, acid handling for wire scouring, table rolls, and machine wires.

The suggestion was made that flat boxes should not be used along with a suction press since they decrease felt life. A very short suction box was mentioned as being used to clean up the edge of a felt which becomes dirty from carrying a shaving formed by cutting off one edge of the sheet with a squirt on the wire. Another practice that was cited for cleaning felt edges consisted in the use of twelve inch showers and a suction box open about three feet on each edge. There was one reference to difficulty in keeping a wet felt clean with suction felt rolls. Most satisfactory operation in another case was reported for a felt conditioner in similar service.

Mention was made of one machine that runs on papers ranging in weight from ten to two hundred pounds. Many of the machines in the West were said to be equipped with squeeze rolls.

Some discussion centered on the use of dandy type table rolls. One user stated that he had three of them on two machines, two on another, and one on a fourth machine. They were said to be installed near the slice and to slow up drainage materially.

Reference in one case was made to the removal of the forming board on a machine operating at seven hundred feet. The board was said to be placed back in the machine when running at a thousand feet. It was pointed out by another commenter that some use is being made of a suction box in place of the forming board but that the application apparently hasn't been very satisfactory.

A brief discussion of water pressures on wire showers revealed pressures ranging from twenty-two pounds to seventy pounds, some trouble with dirty wires, and some pitch difficulties. The pitch difficulties prompted some of the experiences with some pitch remedies such as kerosene and emulsifiers to be related. At the same time, reference was made to some of the pulps causing the trouble.

When commenting on the handling of acid for the scouring of wires, the suggestion was made to place the desired quantity of water required for dilution in a barrel and then to add the acid from a carboy to it.

Rubber covered table rolls were said to be expensive but that they didn't seem to carry the water back up against the wire. They also were said to be stiffer because of a steel core. The use of Micarta table rolls also was cited and a few typical experiences with machine wires related.

Temperature Control in Pulp Grinding

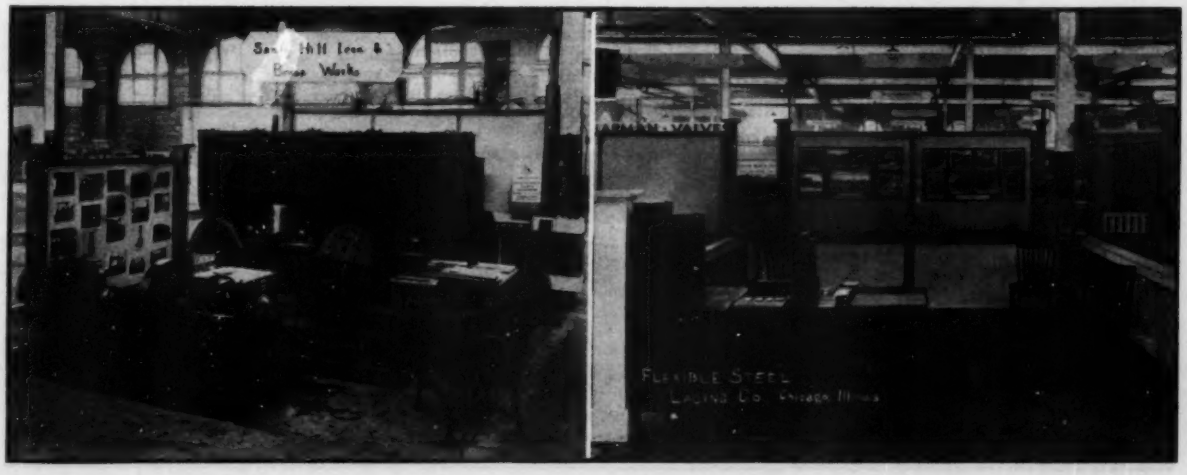
The program of the groundwood group meeting included the presentation of two papers. C. D. DeMers, Taylor Instrument Companies, presented the first of the two. His subject was *Pulp Grinding Temperature Control.*

Today, said Mr. DeMers, the groundwood process is standardized to an extent that would have seemed impossible even twenty years ago. He related that up to and until about nine years ago, grinding temperatures very seldom exceeded 145 deg. Fahr. and in many plants were from 15 to 30 deg. below that point; that temperatures of 155 to 170 deg. are now quite standard and in many plants temperatures of 190 deg. or more are maintained; and that the first satisfactory installation of an automatic temperature control on a wood pulp grinder was made in 1930.

Mr. DeMers then made reference to a study of some years ago, through which it was learned that it was practically impossible to maintain grinding temperatures within 10 to 30 deg. of any predetermined point under hand control of the shower supply to the stone and explained in some detail the conditions and results of a test made during 1936 in a well known Canadian groundwood plant. The test, lasting fourteen days and conducted on a line of three pocket grinders, equipped with natural stones, showed that automatic temperature control permitted grinding temperatures to be maintained within 2 to 4 degrees of any definite predetermined point, increased production 2.25 per cent, decreased power 6 per cent, produced stock of more uniform freeness, and reduced burring operations 17 per cent.

The application of the Taylor control, continued Mr. DeMers, is important in the operation of all types and sizes of grinders—the smaller pocket type as an aid to the increase in production necessary to justify their operation in competition with more modern equipment, and the large capacity units as an aid to the high efficiency necessary to justify the large investment involved.

The discussion following the presentation of Mr. DeMers paper revealed that there has been some evidence of pulp discoloration in grinding at higher temperatures; that a very fine, clean looking pulp without discoloration was maintained in a recent installation operating



at temperatures as high as 195 to 200 degrees; that freeness increases simultaneously with increase in temperature of grinding and at about the same rate; that the regulators are made to take care of a time lag—from half a minute or less up to five, six or seven minutes; and that the time lag is caused somewhat by stock consistency, it being a little greater at low consistency than at high.

Groundwood Riffler Design

Riffling of Groundwood Pulp was the title of the second paper scheduled for presentation before the group meeting. This paper, presented by R. I. Wynne-Roberts of the Norton Company, stated that the five principal factors upon which high efficiency of rifflers depends are:

1. Speed of flow of the stock through the conveying channel
2. Consistency of the pulp suspension
3. Placement of baffles
4. Length and width of the riffler
5. Installation factors

He pointed out that a surface speed of less than 40 f.p.m. is required for high riffler efficiency; that this speed should approach 30 f.p.m. to obtain maximum performance; that the pulp starts to separate along with grit and dirt below 25-30 f.p.m.; that stock approximately one inch deep will flow over the last baffle if a surface speed of around 30 f.p.m. is maintained; that consistency should be held at 0.3 to 0.35 per cent; that better results are obtained by placing baffles at an angle of about 45-60 degrees in the direction of flow; that at higher surface velocities the vertical baffle has a tendency to produce eddy currents in the area between two successive baffles; that at higher stream velocities a spacing of from 18-24 inches gives the better results; that a satisfactory depth for average operation is 4-6 inches; that the minimum length that will satisfactorily settle out the major part of the dirt is 50 feet, although 60 feet is preferable; that the area required per ton of pulp amounts to 75 square feet; that baffles must be level for full width of riffler; that stock flow to riffler must be carefully regulated so that in no time will it enter in surges; that the riffler should be placed at the point of lowest consistency in the stock system, which is usually after the screens; that it is customary to wash out the riffler about twice a week; that rifflers are usually installed in bays of 10-12 feet in width and 60 feet or better in length; that they may be constructed of smooth finished concrete or smooth surfaced lumber such as yellow or white pine, and B. C. fir, Wolmanized lumber having worked out to good advantage; that, if space is a limiting factor, rifflers can be built in double or triple tiers allowing sufficient vertical height between rifflers, say three feet, so that each can be washed without difficulty or interference; that by having two test rifflers (rifflers about 12-15 feet in length and 15 inches wide), one at the head of the main riffler and the other sampling riffled stock, both running concurrently. The grit content of the stock before and after riffling can be measured, thus determining the efficiency of the mill riffler; and that a grit content in riffled groundwood of 5-8 grams per ton of pulp may be considered good practice.

Added comments by Mr. Wynne-Roberts in the discussion which followed the presentation of his paper revealed that the use of sandstone results in at least ten times as much grit per unit of time as the artificial stone; that better and better grades of groundwood papers are being produced; that it is common practice to remove from the pit the grit produced by the sharpening of Norton stones at the time of sharpening; that one mill is grinding untreated Southern pine with a certain degree of success; that the Norton Company recently introduced a coarser stone that has produced a quality of pulp from Southern pine that is not very far remote from spruce; that the grinding of pine and the use of pine for papers other than kraft is as inevitable as night follows day; and that it is necessary to run temperatures up to 180 deg. Fahr. and over in the grinding of pine to get as long a fiber as possible and to get freeness.

Relaxation and Entertainment

The evening of the second day of the convention was one of relaxation. A fine program of entertainment proceeded simultaneously with the dinner and the evening brought to a close with dancing.

Comparative Cost Finding

Three papers and a sound movie were on the program for the general meeting on the morning of the third day.

Mr. Timmerman, after calling the meeting to order, called upon Dr. J. P. Hagenauer to present the first of the three papers, a paper entitled *Cost Engineering*.

Dr. Hagenauer introduced his subject by stating that the paper industry, like any other of the large industries of our country, has in the last 25 years passed through various cycles of development; that expansion in productivity has been followed by a reduction in output and it in turn by a swing towards higher levels; and that each of these cycles has created new and unforeseen problems to be met by management. He recalled the day when cost men, management engineers, or technical men claimed to have solved the problem but iterated that when the sound and fury had abated the practical man remained.

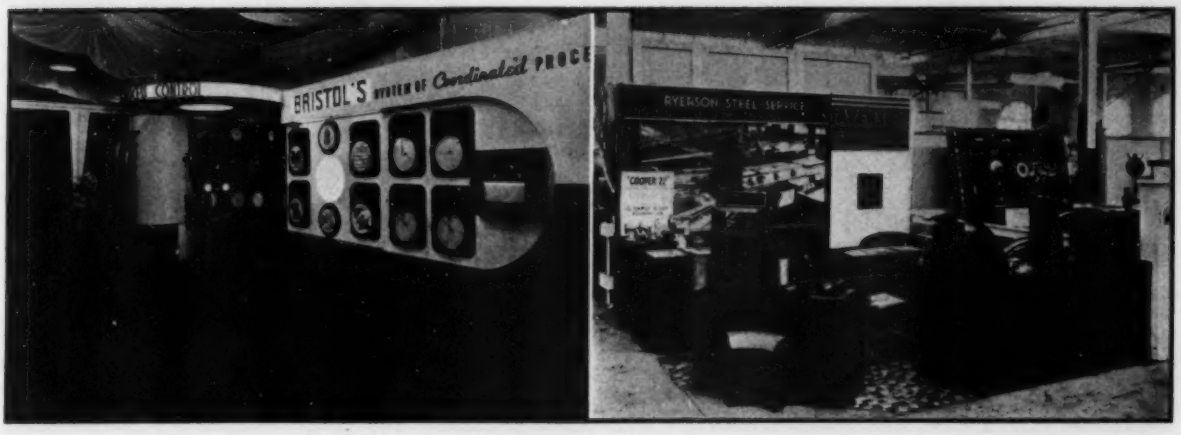
No individual, no class, or group alone, said Dr. Hagenauer, has the right answer. The solution, he continued, lies in the combination of all and in sincere wholehearted co-operation, not only of the individuals in one mill, not only of a group of mills of like products or of similar interest, but in the concentrated effort of all mills in the industry.

In the opinion of Dr. Hagenauer, the time is past when one man can step into a mill and in a few short weeks show tremendous savings. Likewise he expressed the belief that the day of high prices with resulting high profits is gone.

The industry, he said, has reached a period in its development when increased profits can only be realized through increased efficiency of operation.

About two years ago, continued Dr. Hagenauer, the Executive Committee of the American Paper and Pulp Association commissioned the Association staff to investigate, analyze, and, if possible, recommend a solution to the problem of finding a combination of facts relating to production, operating efficiencies and conversion costs which will permit comparisons between mills of the conversion of wood to pulp, pulp to paper, and paper to the finished product as delivered to the customer. He emphasized that the solution of the problem had been sought in a practical way through mill contacts and discussions.

Advice guidance and criticism were solicited by Dr. Hagenauer in behalf of the Cost Engineering staff of the Association—the services of which, he stated, are available to any mill or company in the industry regardless of whether it is a member of the Association or not.



Movie Dramatizes Heat and Its Control

The talking motion picture which was shown immediately following the completion of Dr. Hagenauer's remarks proved both interesting and informative. It was a picture entitled *Heat and Its Control* that was produced by Johns-Manville and filmed by Carval Films, Inc.

This picture, presented by J. W. Hemphill, Staff Mgr., Pulp and Paper Industry, Johns-Manville, visualized the story of heat from the time man worshipped the sun to present-day methods of development and manufacture of materials designed for heat conservation.

Actual laboratory demonstrations, animated drawings, ond shadowgraphs were used in the picture to help visualize the nature of heat and to illustrate heat transfer by radiation, convection and conduction. Molecular activity, the passage of heat through a boiler wall, and how insulating materials resist the passage of heat likewise were illustrated by animated drawings.

Other animated drawings and laboratory demonstrations were used to explain the phenomenon of thermal conductivity and the reasons for the vast difference in the conductivity of different substances. Radiant heat energy also was visualized in the same manner.

A series of shadowgraphs showed air currents set up by heat in so-called dead air spaces and convection currents set up by flames, heated pipes, and the like.

The picture likewise showed man's first efforts toward the scientific conservation of heat, the activity in a modern heat research laboratory, and how new materials for conserving heat are developed, manufactured and utilized.

Most certainly it was a dramatic presentation.

Tests for Printing Papers Discussed

Evaluating the Printing Qualifications of Paper was the title of the second paper to be presented before the general meeting on the third morning of the convention. It was a joint paper by M. S. Kantrowitz and T. H. Simmons, both of the U. S. Government Printing Office, and was presented by Mr. Kantrowitz.

In the presentation of this paper Mr. Kantrowitz stated that the correlation of paper and ink in the printing process involves careful technical supervision and the closest possible co-operation of the paper and ink manufacturers and the printer-user to obtain best results; that laboratory tests for strength, opacity, sizing, thickness, gloss, smoothness, oil penetration and air permeability are directly related to the quality of the performance of the paper in the printing processes; and that the degree of sizing does not always give an indication of the ink penetrability of the paper.

Citations were made to several articles in the literature dealing with the subject and then emphasis was placed upon smoothness, oil penetration, oil absorption and other characteristics related to printing quality.

Mr. Kantrowitz related that smoothness is one of the most important printing properties of paper; that the first practical instrument used by the Government Printing Office for measuring the smoothness of paper surfaces was a combined smoothness and porosity tester invented by Dr. Julius Bekk; and that the Government Printing Office purchased the first of these instruments to be sold in the United States.

After giving the detailed method for measuring the smoothness of paper by means of the Bekk tester, he called attention to the Gurley smoothness tester and the Williams smoothness tester and said that the three instruments employ the same basic principle—measuring the rate of air flow between the two surfaces. Mr. Kantrowitz added that the Williams tester differs from the Bekk and Gurley instruments in that the air flow takes place between two paper surfaces pressed against each other and not between the paper surface and a hard, polished surface as in the case of the two latter instruments.

The penetration of printing inks into paper, he said, is dependent primarily upon the vehicle used in the manufacture of the ink. For determining the oil penetration of paper, continued Mr. Kantrowitz, the Government Printing Office uses the "Oil Drop Method" with castor oil as the standard liquid medium in the test. He also referred to an apparatus and method for determining oil penetration in which castor oil, cod liver oil and an ink oil are used as liquid media and to the use of a photoelectric cell with which either castor oil or oil inks are used as the penetrating liquid—the operation of the instrument being based upon the change in light reflectance from the opposite surface of the sheet as the medium penetrates it.

Detailed information was given on the method used by the Government Printing Office for measuring the oil permeation of paper. The method included test procedures for oil penetration and oil absorption determinations.

The other paper characteristics related to printing quality that were touched upon in the paper were: weight, thickness, formation, porosity, opacity, compressibility, picking, and fluffing or dusting.

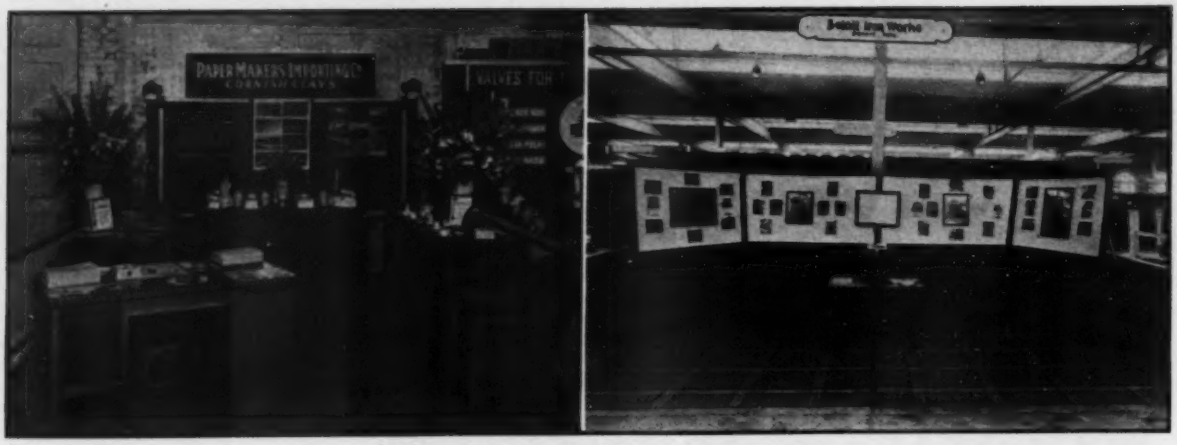
Some brief comments also were made on paper difficulties experienced in relation to printing quality, on the proof press as a means of evaluation, and on ink receptivity.

This paper stimulated some very interesting discussion around the subject of smoothness testing in which F. M. Williams of Williams Apparatus Company, Watertown, N. Y., manufacturer of the Williams Smoothness Tester, and Robert G. Betts of the W. & L. E. Gurley Co., Troy, N. Y., manufacturer of the Gurley Smoothness Tester, protested against the standardization on the part of the Government Printing Office on the Bekk instrument. It was suggested that an attempt be made to correlate the readings of the three smoothness testers and to furnish comparative figures in paper specifications.

Paper Machine Drive Development

Robert L. Wickes of the American Leather Belting Association presented the third and last paper before the general meeting on the morning of the third day of the convention. His subject was *Modern Mechanical Drive for Paper Machines.*

Reference was made by Mr. Wickes to the old Marshall drive, to the Walmsley or English drive, to the individual mo-



tor sectional electric drive, and to the modern mechanical belt drive. He said that the old Marshall drive had a number of disadvantages—dirty, noisy and dangerous gears, clutch trouble, small cone pulleys, low belt speed and belt trouble; that the Walmsley or English drive, which operated a machine very satisfactorily, cost considerable to install and maintain and required a large amount of space in the machine room basement; and that the individual motor sectional electric drive brought complete freedom from shutdowns due to clutch or belt trouble but substituted certain inherent difficulties, one being very high first cost with consequent high carrying charges.

Mr. Wickes added that the paper machine manufacturers can now provide a modern mechanical drive that takes advantage of the space saving features of the Marshall drive but eliminates its weaknesses; that electrically-controlled clutches, operated by a rheostat from the front of the machine, have ample capacity for heaviest loads; that even the most inexperienced operator can start a section equipped with this type of clutch with perfect smoothness and ease; that push button control for shifting of belts also is handled from the front of the machine; and that the instant response to this push button control allows such fine variations and control of the sectional speed that the machine can be run at top speed for each grade of paper with the greatest of ease.

Numerous other features of the drive were brought out in a series of lantern slides.

Comments of Harry Newton Clarke

The speaker at the noon-day luncheon on the third day of the convention was Harry Newton Clarke, Counsel on Industrial Morale and Personnel Problems. *Men, Money, Management and Misunderstanding* was the very striking subject of his address.

After a brief introduction by Adam Wilkinson, Labor Commissioner, American Writing Paper Corporation, he immediately began to elucidate on the first of the four parts of his subject. He stated that there are forty million to forty-three million people normally employed in the United States; that there are two to three people dependent upon each one of them; that eighty per cent of those employed are misfits more or less; that the whole aspect of today's problem would be changed if the people could be put in jobs where they belong; that on an average one hour in every eight hours of work is wasted; that this waste at fifty cents an hour amounts to twenty million dollars a day; that in a normal year there are forty million changes in employment in this country; that these changes are brought about by seasonal work, conditions beyond control and otherwise; that the average cost of each change is seventy-five dollars; that no change in industry costs less than twenty-five dollars; and that 13,200,000 workers received less than a fifteen hundred dollar annual income.

Money, he said, is only in five places—cash in the bank; in land, buildings, and machinery; in raw material on hand to carry on the business; goods in process but not completed; and in goods shipped but not paid for.

The average investment per employee in manufacturing industry outside of public utilities, he said, is $7500. Income on these investments, commented Mr. Clarke, must come out of what you and the other fellows make. The important job, he continued, is to interpret to the working masses what money is and what it does.

Management, said Mr. Clarke, is the art of getting men and money to understand each other and to work together intelligently.

He suggested the need for building up the right kind of personnel both in manufacturing and in distribution and said that management must learn to make a selection of people, must train selected people for work where their fitness best adapts them, must pay them intelligently, and must supervise them inside the plant.

The great crowd of employees is the buying public, said Mr. Clarke, and because of it he recommended that the employer must do a little better job inside his plant than competition.

He stressed the need for thinking in terms of economizing irreplaceable natural resources and made the added suggestion to quit talking about co-operation and perform.

Election of Officers

A short business session was held immediately following the opening of the general meeting on the afternoon of the last day of the convention. At this session there was a report of the auditing committee, the committee on resolutions, and the nominating committee together with the election of officers.

The slate of officers as elected was as follows:

B. D. Millidge, Howard Smith Paper Mills, Ltd., President.

F. L. Zellers, French Paper Company, First Vice President.

H. H. Harrison, Crystal Tissue Co., Second Vice President.

A. B. C. Drew, Pairpoint Corporation, Third Vice President.

Oscar Stamets, Riegel Paper Corporation, Fourth Vice President.

Grover Keeth, Marathon Paper Mills, Fifth Vice President.

R. L. Eminger, Secretary-Treasurer.

George W. Craigie, Field Secretary.

The election of Mr. Millidge to the presidency is tangible evidence of the friendly bond that exists between the industry in Canada and the United States. His election also sets a precedent as he is the first president of the Association to be elected from the Dominion.

Following the election of officers, the remainder of the afternoon meeting was given over to the presentation of two papers and the showing of a motion picture.

Forces of Progress in the Industry

The first paper, *Progressive Forces in the Paper Industry*, was the subject of George R. Wallace of the Fitchburg Paper Company. Mr. Wallace cited a personal experience in regard to the 75th anniversary of his company, the anniversary being last year, to reveal how one's attitude toward business is

affected by economic conditions. He related the conditions that were found in the industry during those unhappy days from 1931 to 1936 and intimated that the industry began to go forward when the executives of the industry formed an association and from association contracts learned that competitors were really human beings and could be talked to without any intense desire to commit murder or mayhem.

Mr. Wallace then commented that the Technical Association of the Pulp and Paper Industry, the American Pulp and Paper Mill Superintendents Association and associations of executives and salesmen are tremendously strong, progressive forces in the industry; that they bring together men with a common interest to exchange ideas and help make the industry work on the principle of "One for all and all for one"; that it is necessary for mutual appreciation and understanding to exist between the departments of production and technology; that the demand for close laboratory control has resulted in a higher and more uniform product; that companies with technical staffs have benefited by lower costs of operation; and that in the last ten years the industry has been forced forward by the contribution of technical men, chemists and chemical engineers.

Another force of progress for the industry, continued Mr. Wallace, is the development of more modern machinery by technologists and by the machinery manufacturers. He also placed some stress on the development in the South, intimating that the use of paper was going to increase as a result of it in ways neither the public nor most in the industry ever imagined.

Gearmotors and Speed Reducers

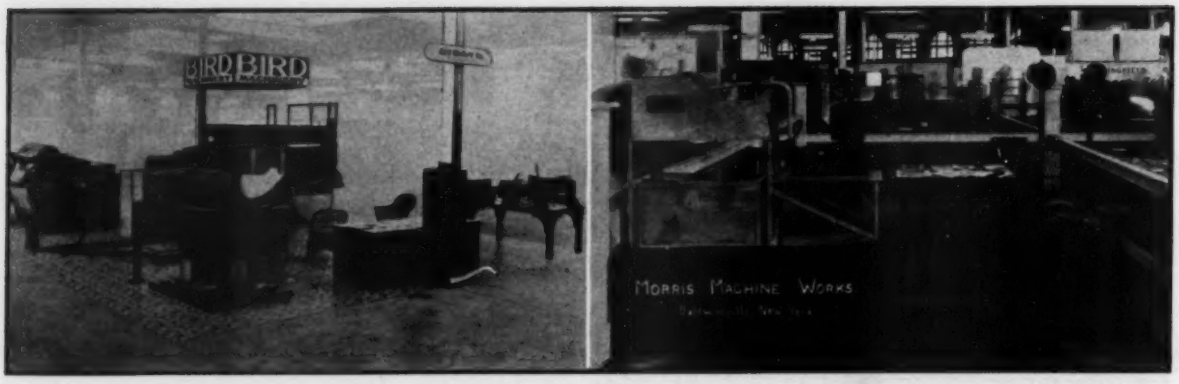
R. S. Marthens, Westinghouse Electric & Manufacturing Company, presented the second paper before the afternoon meeting of the third day. His subject was *Application of Gearmotors and Speed Reducers in the Paper Industry.*

After listing a number of advantages of enclosed geared speed reducers, among which were reduction in space requirements, practical elimination of maintenance cost, quiet and safe operation, high mechanical efficiency, imperviousness to dust and moisture, and neat appearance, Mr. Marthens tabulated, as shown in the accompanying table, various pulp and paper mill drive applications as to type of drive which is considered most satisfactory.

In commenting further, Mr. Marthens stated that the most recent in enclosed geared speed reducers is the gearmotor; that several types of gearing, such as spur, single helical and double helical, together with planetary and non-planetary designs, are being used at the present time; that worm gears, straight or spiral bevels and hypoids may be used for right angle drives; that the modern gearing parts used in connection with gearmotors generally show an efficiency of approximately 96 to 98 per cent for single reduction units and 94 to 96 per cent for the double reduction type;

Pulp and Paper Mill Drive Applications

	Motor Only	Gearing Possibilities	Definite Gearing Applications
Wood Room			
Barkers {Tumble Drum		X	
Barkers {Disc		X	
Chippers	X		
Chip Screens		X	
Conveyors			X
Grinder Room			
Pulp Grinder	X		
Wet Screens		X	
Wet Machine		X	
Thickeners		X	
Save-All			X
Conveyors			X
Plunger Pump		X	
Centrifugal Pumps	X		
Wet Screening Room			
Knotters		X	
Pine Screens		X	
Thickeners		X	
Stock Pumps		X	
Chest Agitators			X
Bleaching Department			
Bleacher			X
Thickeners		X	
Washers		X	
Beater Room			
Beaters		X	
Chest Agitators			X
Stock Pump		X	
Jordan	X	X	
Machine Room			
Paper Machine {Cylinder			X
Paper Machine {Fourdrinier (All Sectional Main Drives)			X
Paper Machine {Cylinder		X	
Paper Machine {Fourdrinier (Mechanical Drive)		X	
Cylinder Paper Machine (Wet End Auxiliaries)			X
Paper Machine Auxiliaries			
Broke Conveyor			X
Fourdrinier Lift			X
Felt Stretchers			X
Calender Roll Lift			X
Finishing Room			
Super Calender			X
Winders			X
Rotary Cutters		X	
Trimmers		X	
Platers		X	
Platers		X	
Corrugators		X	
Conveyors			X



that anti-friction bearings have played an important part in the development of gearmotors; that lubrication is a relatively simple matter in gearmotors, since the same oil can be used for both gears and the bearings; that in practically all gearmotors, the high speed pinion is mounted adjacent to an anti-friction bearing and an oil seal is located between this bearing and the motor parts; that many troubles previously encountered due to inaccurate gear cutting, faulty alignment, etc., have been eliminated; and that many of the design features and manufacturing operations applying to gearmotors also are used in the coupled type enclosed speed reducer.

Among the drive applications for this type of speed reducer that were described were: bleacher unit, beater, paper machine, reel, rewinder, supercalender, and calender. Mr. Marthens also made added reference to gearmotor applications and described typical installations on plunger type stock pumps, propeller type agitators for stock chest service, cylinder and couch rolls, winders and top press rolls.

Numerous lantern slides were used by Mr. Marthens to explain and illustrate the various points brought out in his paper.

Color—A Movie

The showing of a motion picture, entitled *Color*, and presented by Heller & Merz Division, Calco Chemical Company, completed the program of the general meeting.

The Annual Banquet

The annual banquet, held on the evening of the third day of the convention in the Municipal Auditorium in the City of Springfield, was enlivened with an organ recital by Alice Browne Smith as well as with speech making. Adrian L. Potter, Secretary, Convention Bureau, Springfield Chamber of Commerce, was toastmaster of the occasion.

His Excellency, Charles F. Hurley, Governor of the Commonwealth of Massachusetts, was introduced by Mr. Potter as the first speaker on the banquet program. With a few well chosen words, the Governor extended greetings and paid respects to those assembled and to the Governors of their respective states in the name of four million people of his great state.

Some brief remarks by Mr. Timmerman followed those of the Governor. Mr. Timmerman called attention to the fact that he was now just an ex-official; expressed the pleasure that was his in serving the Association as President; mentioned that the office took time and effort but that his reward came from the number of friends that Association work brought him; stated that he had had the finest co-operation possible; thanked every one for the privilege of serving; and then presented B. D. Millidge as President for the ensuing year and as the first National President of the Association from Canada.

Mr. Millidge expressed his thanks for the honor which had been bestowed upon him; said that he felt like an ambassador from Canada; remarked that he would do his very best as President; stated that he would be well satisfied if he were able to do as good a job as his predecessor; called attention to the convention next year in Toronto; made the first solicitation for attendance at the Toronto convention; and congratulated the Springfield convention committee for the work it had done in putting over a wonderful convention.

Several telegrams were read by Mr. Timmerman at the completion of Mr. Millidge's remarks, one of them being from M. J. Ketter and E. E. Dunbrow, another from E. T. A. Coughlin, and a third from Francis D. Bowman.

Then the meeting was turned back to Mr. Potter, who called upon Honorable Henry Martens, Mayor of Springfield, Honorable W. P. Yoerg, Mayor of Holyoke, and Mr. James R. Dearden, Chairman of the Board of Selectmen of West Springfield, in the order named, for some remarks.

Mayor Martens expressed the hope that Springfield had been enjoyed as the convention city; congratulated the committee in charge of the convention in behalf of the City of Springfield; and made a bid for another national convention of the Association within the next four years.

Mayor Yoerg said that he was pleased to bring greetings of Holyoke, the paper city, and went a step further than Mr. Martens in bidding for another convention by expressing the hope that the 1939 convention might be held in Holyoke.

With a few pleasing remarks by Mr. Dearden and an announcement by John P. Kennedy relative to golf prizes, W. H. Brydges of Bedford Pulp and Paper Company was called upon to present the past president's jewel to Mr. Timmerman. Following the presentation, the toastmaster introduced W. Gordon Booth, General Chairman of the Convention Committee, and read the list of the various committee chairmen. The list as read was as follows: C. H. Kent, Executive Secretary; John H. O'Connell, Banquet; Charles Davidson, Jr., Entertainment; Leonard P. Taylor, Exhibits; A. B. C. Drew, Finance; John P. Kennedy, Golf; Robert W. Patterson, Mill Visits; John H. Browne, Papers; Joe L. Hodgins, Publicity; M. O. Morris, Program; William H. Croft, Reception; Leroy D. Frisbie, Registrations; George S. Carroll, Transportation; and Mrs. Charles Champion, Ladies.

At this point in the banquet proceedings the Paper Progress Exhibition prize winners were drawn and the Sinclair Company prize winners announced.

Remarks of Charles W. Boyce

Toastmaster Potter then called upon Charles W. Boyce, Secretary of the American Paper and Pulp Association, to address the group. Mr. Boyce spoke in place of D. C. Everest, who had been scheduled as a speaker but found it impossible to attend.

In his remarks Mr. Boyce said that the paper and pulp industry is one of amazing contrasts; that it is among the oldest of all industries, yet it is young; that the industry is intensely dynamic; that forward progress in the industry will be more difficult to achieve as time goes on; that the dank odor of the depression was still about us when the industry began to expand; that it appears that by the end of next year our over-all capacity will have reached the seventeen million ton mark; that the last major expansion movement was based upon the domestic market, but, to a large extent, the capacity increases occurred in Canada; that the expansion in the South is wholly within the United States; that mass production in paper manufacture started in newsprint; that

it is now moving in the wrapping paper field and will undoubtedly move farther as consumption of other grades develop to a point that justifies concentration upon the production of a single grade or of comparatively similar grades; that the application of mass production principles in the manufacture of other grades, such as sulphite bonds and book paper, now well under way, is bound to go farther; that the average price of paper has been going down steadily for several decades, with the exception of the war period when shortages forced prices too high; that this condition is probably the most important element in the unprecedented rise in the consumption of paper; that the margins of profit in the paper and pulp industry have become so narrow and profitable operation so dependent upon minor variations, that more rigid control measures must be established and a broader experience must be available for comparison; and that it is essential for the operating man to keep his mind flexible in respect to his own operating conditions, to be willing to experiment, and upon the basis of adequate trial to adopt in his own operations whatever proves feasible in the forward development of the industry.

Mr. Boyce concluded his remarks by congratulating the American Pulp and Paper Mill Superintendents' Association upon its accomplishments; extended to the Association the co-operation of the American Paper & Pulp Association; and suggested that the associations of the paper and pulp industry were not in competition but supplemented one another.

Presentations at Banquet

Several presentations completed the banquet program, the first a testimonial in the form of a framed resolution, the second—a life membership in the Association, the third—the L. D. Post Memorial Trophy, and the fourth—a memorial plaque.

The testimonial in the form of a framed resolution was presented by W. H. Brydges to C. H. Kent, Executive Secretary, General Convention Committee, in appreciation for his efforts in connection with the convention.

The recipient of the life membership in the Association was Craig Maxwell of the McDowell Paper Mills. It was presented to him by Charles Champion.

John Cornell of *The Paper Mill* presented the L. D. Post Memorial Trophy to Frank Timmerman. As in years past, this trophy was a beautiful Hamilton watch.

Fred Boyce, first President of the Association, received the memorial plaque, the presentation being made by Roy Zellers.

There also was the presentation of four large bouquets of roses, one to Mrs. Charles Champion, another to Mrs. Frank Timmerman, a third to Mrs. B. D. Millidge, and the fourth to Mrs. W. Gordon Booth.

With these presentations completed, Mr. Timmerman expressed his thanks and sincere appreciation to W. Gordon Booth, to the members of Mr. Booth's several committees and to Mr. Potter for their splendid service in handling all details of the convention.

An organ rendition of the "Star Spangled Banner" by Alice Browne Smith followed by the singing of "America," while she accompanied on the organ, brought the eighteenth annual convention of the American Pulp and Paper Mill Superintendents' Association to a close—a convention with the largest registered attendance in the history of the Association.

The Ladies Program

No report of the convention, however, would be complete without some mention of the ladies' program and of the Paper Progress Exhibition.

The highlights of the ladies' program included a get-together at Storrowton at noontime on the first day of the convention for luncheon, music and inspection of the village and bridge; the clam bake on the evening of the first day in which they joined with the men; a college tour with luncheon at Wiggins Old Tavern or the alternative of luncheon at Book Shop Inn, South Hadley and golf at the Orchards Golf Course during the morning and afternoon of the second day; dinner and entertainment with the men on the evening of the second day; and a third day's activities that began with a visit to the museum center in the morning, took in a sight-seeing trip, luncheon and a bridge tournament at Pecousic Villa, Forest Park, at noontime and during the afternoon, and culminated with the annual banquet in the Municipal Auditorium where again the program was enjoyed jointly with the men.

Paper Progress Exhibition

The Paper Progress Exhibition was one of the most outstanding features, if not the most outstanding feature, of the entire convention. Acording to some comments, it was the largest display of pulp and paper making equipment and supplies that has ever been shown in the history of the industry. The exhibits, at least, gave the operating man a chance to examine first-hand some of the items of new equipment which he may only have known about previously through salesmen's contacts or through some of the advertising that may have been done on them.

May the following list of exhibitors and brief resumé of items exhibited by each of them show the magnitude of the exposition and demonstrate the educational value of it.

Acorn Refining Company, Cleveland, Ohio—Samples of various Acorn products as protective finishes in paper mills, including CMC Metallic Coating, made from a special metallic alloy and vehicle; Insola, a combination of red lead and graphite recommended as a priming coat under CMC Metallic Coating; Superbright Aluminum Paint for exterior of buildings and other general uses; Duroplastic Calking Compound; Acolite Machinery Enamel and Nuroof Liquid Asbestos Roof Coating.

The American Brass Company, Waterbury, Conn.—Anaconda tubes in all sizes used in the paper industry including large diameter, seamless, drawn tubes for conveying pulp and white water as well as the smaller diameter carrying lines assembled with solder and flared tube type Anaconda fittings; Phosphor Bronze Jordan bars, Phosphor Bronze Perforated screen plates, Everdur parts and equipment including welded tanks, fourdrinier wire and cloth, and Red-Brass Pipe.

Baldwin Belting & Leather Co., Inc., New York, N. Y.—FRICTIONIZED belting in operation under oil, water, heat, high speed, and severe bending conditions; a transmission testing machine for subjecting the belt to the same conditions as encountered in the field; and descriptive material on other testing equipment and process used in the manufacture of Frictionized leather belting.

Baldwin-Duckworth Chain Company, Springfield, Mass. — Series of roller chains beginning with a chain of small pitch driven by fractional hp. motor and through a series of reductions ending with one of the largest roller chains operating at a very slow speed; exhibit board showing different types of chains, including machine finished roller chains in pitches from ⅜ to 2½ in. and replacement series chains for conveyor work; block chains, stainless steel and bronze chains; cable or leaf chains; and roller chain flexible couplings.

Barkon-Frink Tube Lighting Corporation, Long Island City, N. Y.—Three standard models and a new portable model of Barkon Carbon Dioxide Daylight lamps.

Barrett-Cravens Company, Chicago, Ill.—Motor operated platform lift truck for double deck skids of paper, and small hand truck for single skid handling of paper.

The Bauer Brothers Company, Springfield, Ohio—Refiner, open for inspection, as well as a display of fibers that have been refined in Bauer equipment, display including groundwood screenings, sulphite and kraft rejects, semi-chemical cooks and re-treated and fully prepared stock for the paper machine; and new classifier for fibers.

Beloit Iron Works, Beloit, Wis.—Enlarged photographs of suction drum press installations and dual press installations, illustrating an arrangement which permits the use of a short top felt, at the same time using two or three primary presses by locating them over the vat; and motion pictures showing installations of press and press in operation.

Better Packages Incorporated, Shelton, Conn.—Two flat paper packing and sealing machines in operation, one machine for sealing cartons of flat paper while carton and paper are under pressure so as to squeeze out air from between the sheets of paper, the other for making bundles of coarse, flat papers and boards by using very wide (10 in. or 12 in. wide) sealing tape; box makers' automatic electric sealer, which feeds continuous strips of paper or cloth tape, measured, moistened and cut off at any speed desired; ream sealing machine; and Counterboy sealers.

Bird Machine Company, South Walpole, Mass.—Model 3A Screen with dual drive in operation; Triple treatment Centrifiner; Bird Save-All with all modern improvements; Vickery Felt Conditioner, complete with piping, gauges and auxiliary equipment; Vickery doctors; and shower pipes.

Boiler Equipment Trust, North Amherst, Mass.—Model of complete boiler and setting, equipped with a complete working model of the B. E. T. boiler tube cleaner operated with compressed air; and a frame containing a group of letters received from paper mills giving their experience with this cleaner.

The Bristol Company, Waterbury, Conn.—Mechanical Man or Robot, performing before panel, symbolizing fact that by means of Bristol's Co-ordinated Process Control, it is possible to control operation of valves and electrical equipment in plant processes for which exact schedule of operation has been determined from procedures in the past; resistance thermometer for recording temperatures on a wide-strip chart; Pyromaster—used as a round-chart recording tachometer, or as a potentiometer for recording temperature; Free-Vane air operated ampliset time-temperature controller mounted on panel to demonstrate use in controlling process temperatures, and to indicate simple screw driver adjustment for changing sensitivity of instrument; and electric integrating flow meter.

A. E. Broughton and Company, Glens Falls, N. Y.—Fuzz Collector System for carrying away fuzz, scale, and particles circulating above dryer surface and maintaining dryer in a polished condition; Unit Vacuum Control System, set up for installation without basement under paper machine; allowing operators to graduate vacuums to any degree required by throttling air only and not the water removal from boxes; pump and metering unit for taking care of condensate from any Broughton Drainage System delivering water of condensation direct to boiler house without use of any cooling water; and prints of different types of installations.

Brown Instrument Company, Philadelphia, Pa.—Brown instruments for record and control of power plant equipment, drying and processes, temperature and liquid levels, machine speed, air conditioning, etc.; typical Minneapolis Honeywell non-recording controlling instruments applicable to all types of heating, ventilating and air conditioning installations and numerous processes; thermostats; remote temperature and pressure controllers; refrigeration controllers; humidity controllers; solenoid and motor operated valves; and illustrations showing application of Brown area type flow meter to the measurement of black liquor and other viscous liquids.

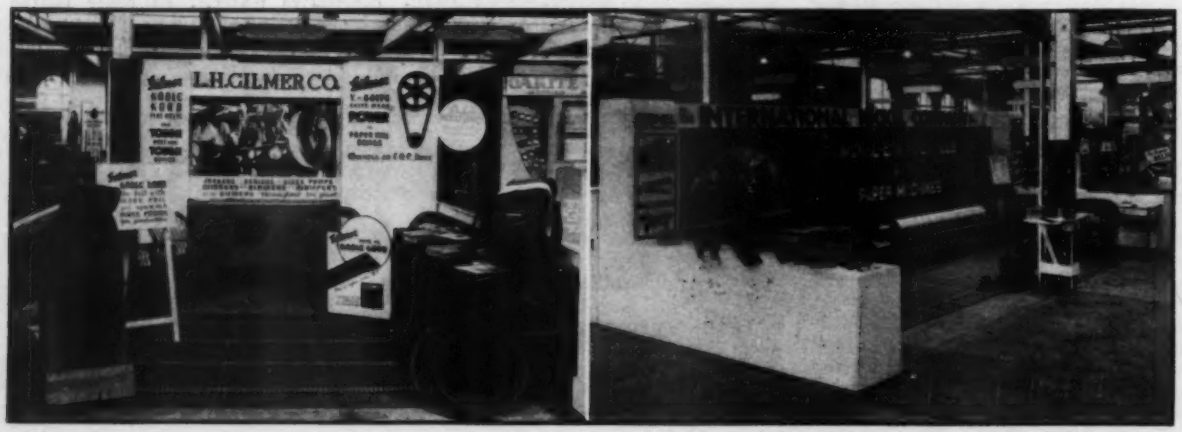
Cameron Machine Company, Brooklyn, N. Y.—Rolls of paper slit on Camachines as well as photographs of the Cameron mill type winders; and machine demonstrating new Cameron automatic web tension device.

Carthage Machine Company, Carthage, N. Y.—New rotary type chip screen set up to operate.

Chapman Valve Manufacturing Company, Indian Orchard, Mass.—Complete line of steel valves for steam service as well as iron and bronze valves of various sizes and designs; a 600 lb. steam valve equipped with a Chapman motor unit; and a display of Chapman tilting disc check valve.

Cheney Bigelow Wire Works, Springfield, Mass.—Complete Information Bureau with road maps, time tables, bus schedules and the like; telegram-sending facilities by either Postal or Western Union; railroad accommodations; errand boy service; and stenographic service.

Chromium Corporation of America, New York, N. Y.—Full size pieces of various pulp and paper mill equipment, chromium-plated by the CRODON process, including a small assembly section of curved slide and making board, conventional and "open-back" flat screen



plates as well as various types of rolls, a new and heavier type of curved screen plate with back relieved and slots tapered to provide additional strength, a flat screen plate especially designed for screening kraft, and an open-grain press roll for use in either first or second press positions on short-fibered or clay-filled stock and also on ground wood or sulphite; and illustrations of applications of industrial chromium plating to various types of paper mill equipment.

Clinton Company, Clinton, Iowa—A resting place.

Continental-Diamond Fibre Company, Newark, Del.—Dilecto paper machine parts, such as suction box covers, doctor blades, roll covers and other paper mill applications; several vulcanized fibre parts; and a general display of all Continental Diamond Fibre Products sold under the trade names—Dilecto, Celeron, Diamond Fibre, Micabond, Vulcoid and Diliophane, a new translucent sheet material.

Corn Products Sales Company, New York, N. Y.—A resting place for Superintendents at the Paper Progress Exposition.

Crane Company, Chicago, Ill.—Crane 10 in. pulp stock valve, a very new Crane product.

DeZurik Shower Company, Sartell, Minn.—Stock consistency and weight regulator said to be capable of handling any density from 1¾ per cent to the heaviest which can be pumped; a number of easy opening valves in straight-way, three-way and angle patterns, made of both iron and bronze; a full size shower pipe complete with cut-away lump strainer; selection of large size spray nozzles such as are used on flat screens, stock washers, pulp grinders, etc.; several cleanable trim squirts or deckle cutters; samples of pulp wood cleaned on knot boring machine; blocks of wood showing the various defects both before and after cleaning on knot boring machine; and samples of rejected material from both knot boring and knot saving machines illustrating amount of dirt removed from pulp wood by these machines.

Dilts Machine Works, Fulton, N. Y.—A Hydrafiner, a Classifiner opened up to show interior construction and a small Propeller Agitator.

Downingtown Manufacturing Company, Downingtown, Pa.—A complete suction felt roll; a moving picture showing an extractor roll, suction rolls and suction felt rolls in operation; and photographs of various installations of Downingtown equipment.

Duriron Company, Inc., Dayton, Ohio.—Stainless steel castings for use in sulphite pulp industry; stainless steel valves, pumps, and pipe fittings; "Udimet," a stainless steel not only highly resistant to sulphite liquors but also to weak sulphuric acid; and Duriron and Durichlor valves, pipe fittings, agitators, absorption jets, and dissolving jets for dissolving and handling alum, for chlorinating water and for other corrosive conditions involved in the bleaching of pulp and in the manufacture of paper.

Flexible Steel Lacing Co., Chicago, Ill.—Alligator steel belt lacing, Alligator belt cutters, Flexco HD belt fasteners, Flexco Rip Plates and Flexco and Flexco-Lok Guards for electric lamps.

France Packing Company, Tacony, Philadelphia, Pa.—A complete line of metallic packing for use on all types of engines and compressors.

Foxboro Company, Foxboro, Mass.—Verigraph, Remote Stuff Gate Controller and Pneumatic Loading Control, each in operation; and standard line of instruments for temperature, level, pressure and flow control.

Gatke Corporation, Chicago, Ill.—A Hydrotex Jordan bearing for water lubrication; Lubritex non-metallic moulded bearings for oil lubrication; Graphitex self-lubricated bearings; representative bearings for other paper mill application; and a selection of large ring bearings, Gatke Industrial brake blocks and lining, clutch facings, gears and gear stock.

General Electric Company, Schenectady, N. Y.—A water tight controller for sectional drives; a gear-motor with the gear case cut away so that gear train may be observed in operation; a splash-proof motor for paper mill service; an air circuit breaker with solid silver contacts; a light sensitive recorder; a combination mercury-Mazda lighting unit; a background showing modern drives for paper machines, winders and Jordans, as well as interesting views of top-roll and cylinder-mold drives, and a General Electric water cooler.

L. H. Gilmer Co., Tacony, Philadelphia, Pa.—Kable Kord Flat Belting which is built upon a patented "two-belts-in-one" construction and Gilmer V-Belts.

Graton & Knight Co., Worcester, Mass.—Research leather belting, belt cements and dressings, leather packings, and lace leather. Working display showing economies of research belting.

Gulf Refining Company, Boston, Mass.—Lubricants for the pulp and paper industry.

Heller & Merz Division of The Calco Chemical Company, Inc., New York, N. Y.—A color information bureau.

Paper Makers Chemical Division of Hercules Powder Company, Wilmington, Del.—A large display of paper making chemicals.

Hermann Manufacturing Company, Lancaster, Ohio—A complete set of pulp testing and sheet making apparatus,—sheet machine, disintegrator, pump, press, dryer rings and discs; models of the Hercules Type assembled jordan shell filling and refilling plug liner; and photographs of Improved Claflin refiner; of 150-ton rotary paper duster; and of Hercules jordan.

Hills-McCanna Company, Chicago, Ill.—Hills-McCanna Saunders' patent valve for specific service in paper mill installations.

Horton Manufacturing Company, Minneapolis, Minn.—A uniform torque variable speed pulley for winding directly from paper machine and as a drive for any kind of rewinder used in converting; a torque compensatory super drive designed to automatically regulate flow of torque to conform with fluctuating demands of driven machines operating under load variables; and a uniform torque brake designed to hold web tension uniform when rewinding from backstands and reels.

Rodney Hunt Machine Co., Orange, Mass.—A turbine water wheel; a laboratory test wheel; and wood, metal and rubber rolls.

F. C. Huyck & Sons, Albany, N. Y.—A resting place.

Hyatt Bearing Division, General Motors Company, Harrison, N. J.—Display showing extensive use of roller bearings in pulp and paper mill machinery.

Ingersoll-Rand Company, Phillipsburg, N. J.—A Class EGV heavy duty stock pump; a Motorpump for light stocks, white water and general service; a Class NT pump for boiler feeding; two small air compressors; a Motorblower; an air ejector; and large photographs of such equipment as surface condensers, barometric condensers, large air compressors, vacuum pumps, Diesel engines and refrigeration equipment.

International Nickel Co., Inc., New York, N. Y.—Monel covered steel rolls; dryer doctor blades of heat treated "K" Monel; "Trimbey" alum and color meter of new design; special flat mesh Monel dandy roll cover of "Sinclair" manufacture; and samples of Monel save-all tray as constructed by Rice, Barton & Fales, Inc.; Monel jordan fillings; perforated rotary screen plate of Monel; evaporator tubes, "K" Monel ash ejector; and of other miscellaneous uses.

Johns-Manville, New York, N. Y.—Revolving turntable showing crude asbestos rock as it appears when mined; asbestos fibre and intermediate products in its manufacture; insulation; refractory cements; friction materials; roofings and other materials that are used in the maintenance of paper mill operations Transite pipe; a product of Portland cement and asbestos fibre, and Superfloss used for pitch control.

E. D. Jones & Sons Company, Pittsfield, Mass.—Meeting place for inspection trip to nearby paper mill to observe 1000 pound Jones-Bertram Patent Beater in operation.

Samuel M. Langston Company, Camden, N. J.—Large photographs of Langston slitters and rewinders; and samples of paper rolls made on Langston equipment.

Link-Belt Company, Chicago, Ill.—Novel presentation of Link-Belt Roto-Louvre dryer, showing the moving of the drum and the flow of material and gases through unit; a motorized P. I. V. and worm gear reducer arranged for operation; two panels of installation photographs of conveyors and driving equipment in pulp and paper mills; two panels of non-operating silent and roller chain drives, showing typical layouts; and samples of complete lines of Link-Belt conveying and power transmission chains used in pulp and paper mills as well as popular sizes of anti-friction pillow blocks, babbitted bearings, take-ups and couplings.

Magnus Chemical Company, Garwood, N. J.—Products for use in slime removal, cleaning of machines, felt conditioning, cleaning suction press rolls, washing of felts, etc., and for use in sizing.

Mason-Neilan Regulator Co., Boston, Mass.—Mason-Neilan Demonstration truck, a laboratory on wheels, displaying complete line of Mason-Neilan instruments especially adaptable for use in pulp and paper mill operation.

Merrimac Chemical Company, Boston, Mass.—List of chemicals for paper making and water treatment supplied by Merrimac to Paper Mills.

Midwest-Fulton Machine Company, Dayton, Ohio—Pictures of Midwest beaters and pulpers and Fulton condensate systems; series of performance charts of Fulton systems; illustrations covering Fulton system installation at Crossett Paper Mills; and paper mill plans showing application of Midwest-Fulton equipment.

Morris Machine Works, Baldwinsville, N. Y.—A 1-inch operating model pump handling 3½ per cent stock through glass pipe line; and type "S" slurry pumps for handling chemicals, bleach liquor, etc.

Morse Chain Company, Ithaca, N. Y.—Silent and roller chain drives; chain and Morflex couplings; and Kelpo Clutches.

Nash Engineering Company, South Norwalk, Conn.—Nash vacuum pump arranged to show internal parts. Jennings return line vacuum heating pump and Jennings double suction centrifugal pump.

New England Telephone and Telegraph Company, Springfield, Mass.—Demonstration of Teletypewriter Exchange Service.

Norton Company, Worcester, Mass.—Norton Type "P" Pulpstone; specimens of pulp wood collected from various parts of the world; series of photographs showing typical examples of what happens to a pulpstone when mistreated through carelessness or improper burring or adjustments; and display of grinding wheels and other abrasive products.

Oakite Products, Inc., New York, N. Y.—A moving display, illustrating paper mill operations for which Oakite materials have been developed, such operations as cleaning suction press rolls without hand drilling, washing of felts, cleaning of fourdrinier and cylinder wires, grinding of calender rolls and pressure cleaning of machinery before overhaul; and samples of various materials.

Oliver-United Filters, Inc., New York, N. Y.—Model sections showing drum construction of Oliver-Young thickener, brown stock washer and bleacher washer; samples of valves used with such equipment, and cross-section model of Olivite acid handling pump.

Paper and Industrial Appliances, Inc., New York, N. Y.—Thorsen-Héry Beater; T. B. M. Inward Flow Coarse Screen for Board Mills; Hydraulic Beating System; and revolving type of suction box.

Paper Makers Importing Co., Inc., Easton, Pa.—Enlarged photographs showing China clay production in Cornwall, England; samples of materials from crude granite rock to finished china clay; and products of china clay other than paper.

Penick & Ford, Ltd., Inc., New York, N. Y.—Samples from kernel of corn to finished products featuring pearl and powdered starches, Douglas Clearsol gum, Douglas beater starch and other special starches.

Reeves Pulley Co. of N. Y., Inc., New York, N. Y.—Variable speed transmission; horizontal open design with hydraulic control, Class E, horizontal open design and Class B enclosed horizontal design equipped with electric remote control, and Class E enclosed vertical design with pivoting motor base; Varispeed motor pulley No. 28 countershaft type; and Reeves Vari-speed Motodrive, No. 3201-C-18 Vertical Type, Hydraulic Control, Electric Remote Control and Differential Control.

Rice, Barton & Fales, Inc., Worcester, Mass.—Hypoid driving unit; doctors; steam joints; and collection of pictures of installations, including paper machines and pulp drying machines.

Rollway Bearing Company, Inc., Syracuse, N. Y.—Three types of bearings—full roller radial for excessively heavy rolls such as press roll bearings, floating radial for maximum speeds and axial expansion or adjustment such as are required by dryers and jordans; and thrust bearings (both dual-acting and single-acting) adaptable for jordan and calender stack applications; and enlarged photostats of applications showing where and how straight radial and thrust bearings may be used.

J. O. Ross Engineering Corporation, New York, N. Y.—A resting place.

Joseph T. Ryerson & Son, Inc., Chicago, Ill.—Ryertex Non-Metallic bearings and stainless steel castings for the paper and pulp industry.

Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.—Operating display of English Shake (Bertrams patents) and "Packer" screen with roller shoe drive.

Sinclair Company, Holyoke, Mass.—Art work related to Sinclair watermarked dandy rolls; an open and dandy roll stand that will use both open end and journal type dandy rolls; deep grooved winding wire cylinder mould; and various regular and new meshes of wire cloth in brass, bronze, monel and stainless steel.

S K F Industries, Inc., Philadelphia, Pa.—Dryer cylinder mounting which permits free expansion and contraction of cylinder without imposing thrust loads on bearings or side frames; and line of ball and roller bearings and disassembled pillow blocks.

Socony-Vacuum Oil Company, New York, N. Y.—Lubricants for the pulp and paper industry.

A. E. Staley Manufacturing Company, Decatur, Ill.—A resting place.

Sturtevant Mill Company, Boston, Mass.—Poirier control mounted on stuff box; Poirier vacuum valve for use on suction boxes; Poirier multi syphon leg also for suction boxes; and illustrations and data on Sturtevant Bale Pulper.

Taylor Instrument Companies, Rochester, N. Y.—Press roll load recorder; beater roll pressure recorder; calender roll load indicator; system of grinding control; and Binoc tubing which gives mercury and glass thermometers greater readability.

C. T. Tennant Sons & Company, New York, N. Y.—Griplock strapping tools for the building of pulp, for fastening paper on skids, and for the bundling of boxes and cartons.

Testing Machines, Inc., New York, N.Y.—Schopper tensile strength and elongation tester, motor driven with variable speed drive control; Schopper standard folding endurance tester; Schopper bending fatigue tester for papers, boards, cellophane, etc.; Schopper standard micrometers and paper scales; and data on Schopper rapid Kothen sheet making apparatus and Johnston Fibre Classifier.

Toledo Scale Company, Toledo, Ohio—Exhibit emphasizing line of platform scales, continuous weighing scales, ream weight scales and other specialties.

Walworth Company, New York, N. Y.—Variety of Walworth valves, Walseal fittings, lubricated plug valve, Walco Parmalee and Genuine Stillson wrenches, fittings, cast pipe, and swing check valves of special alloys recommended for caustic service.

Warren Steam Pump Company, Inc., Warren, Mass.—4 in. centrifugal machine chest pump; 5 in. Warren standard centrifugal stock pump with special large suction; 3 in. Warren type "L" hot liquor pump; and parts display.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.—Gearmotor built into a specially designed glass case in which complete operation of the motor is visible; Micarta suction box covers and doctor blades; Industrial Analyzer, a set of meters in one case so designed that complete tests can be made with only one set of connections; and samples of standard and splashproof motors; as well as latest type of De-ion starters and Nofuze circuit breakers.

Whiting Paper Company, Holyoke, Mass.—Large box containing a dozen of the popular priced boxes of Whiting Stationery; numerous boxes of stationery in the Whiting Holiday Line; and samples of practically the entire Whiting Line.

Williams Apparatus Company, Watertown, N. Y.—Standard testing instruments, including hand sheet making equipment, freeness tester, pulp and paper moisture testers, stock disintegrators, centrifuge, smoothness and porosity tester; and graphic surface indicator.

Williams Size & Service Corporation, Watertown, N. Y.—Demonstration of size making machine in actual operation.

Worthington Pump and Machinery Corporation, Harrison, N. J.—4 in. FP-1 Stock Pump; Spare Rotating Element; 1½ CG Worthite Pump; 2 CU-1 Antaciron Pump; and 2 in. Flanged Worthite Valve.

◆ Committee Chosen for Chicago Power Show

The advisory committee of the Chicago Exposition of Power and Mechanical Engineering has been chosen recently. J. Edwin Koch, heating plant supervisor of the Chicago Union Station Company, is chairman of the group which includes many engineers and power executives of the midwest. The exposition is to be held at the new International Amphitheatre in Chicago from October 4 to 9.

The exposition is under the same management which, over a long period of years, has successfully conducted the shows in New York. There is no connection between the management of the forthcoming exposition and those of any previous power shows in Chicago. Charles F. Roth, vice-president of the International Exposition Company, is the manager of the Chicago show and all matters of contract and arrangement are under his personal direction.

◆ F. E. Barth New Head of Graton and Knight

After serving as vice-president of the Graton and Knight Company, Worcester, Mass., for eleven years, Frederick E. Barth was recently elected president of that company, succeeding the late Frank H. Willard. Mr. Barth has been with the firm since 1919, serving first as office manager and then as general sales manager from 1924 until 1926, when he was elected vice-president.

Mr. Barth was born in New York in 1894 and was graduated from business school in 1914. He joined the L. L. Harr Corporation with whom he came to Worcester in 1917 to work on production problems in the Graton and Knight factory.

◆ SMITH & WINCHESTER MANUFACTURING COMPANY shipped a 32,000 lb. carload of paper machinery to the West Tacoma, Washington, plant of Everett Pulp & Paper. The shipment included 86" and 74" S & W Undercut trimmers.

Summer Meeting
Canadian Technical Section

THE Technical Section of the Canadian Pulp and Paper Association, under the leadership of Lorne C. Anderson, of the Ontario Paper Company, Chairman of the Section, met at the Royal York Hotel in Toronto, Ont., June 9, 10 and 11, for the 1937 summer meeting. Remembering the success of the International Meeting, last summer, T.A.P.P.I. was ably represented by its secretary, R. G. Macdonald, who was accompanied by John Traquair of the Mead Corporation, W. G. Macdonald, of the Newsprint Service Bureau, Frank J. Lang, Arthur C. Hayes and Sven Fahlgren from the International Paper Company, Tonawanda Mill. The success of the visit to the Aluminum Corporation plant at Arvida last summer suggested the idea of including visits to plants not directly connected with the manufacture of pulp and paper in the program, members of the conventions being given every opportunity to visit other papermaking operations than their own line if they desired.

Visit to Pressrooms

Through the courtesy of the Toronto Star Publishing Company an opportunity was afforded of witnessing a great daily newspaper in operation. In the editorial offices the gathering and rewriting of local news could be seen in full swing, while around a central desk wires and cables from all over the globe were taken hot from the teletype tickers and sifted into the make-up of the newspaper. Moving through the teletype room the visitors watched with interest the latest flashes from the power strike in Michigan where a hundred strikers pulled switches which threw fifty thousand workers into idleness while their dinners spoiled in iceless electric refrigerators. Descending to the composing rooms great batteries of linotypes were turning copy from the editorial rooms into shining slugs of type which slowly grew on imposing tables into forms from which the pages of the next edition would be printed. In the engraving room photographs were etched on halftone and rotogravure plates, white sketches and advertising layouts were converted into line cuts. A photograph can be snapped at a race meeting or a street accident and fifteen minutes after it enters the engraving room will be developed, engraved, stereotyped and ready to run on the presses. The great presses which print the daily edition at 1400 feet per minute or 40,000 copies an hour were idle, so members could inspect them at leisure or go and watch the electrotype machines casting from matrices made by pressing pulp sheets against the forms of type. Both wet and dry matrices are used in the Star make-up, but the newer machines use dry matrices entirely. In the weekly edition, three-color printing and rotogravure sheets are used, a special press running at 300 feet per minute or 12,000 copies per hour being employed. This press was running and visitors were able to watch the sheet take on color after color, a drum dryer being used between each impression. Perfect register is essential to the production of modern high-grade colored newspapers with a reproduction of an oil painting on the front page every week. The color printing is done from specially prepared halftones while the rotogravure printing is done with rolls which are plated with copper and etched directly with the picture to be reproduced.

Luncheon to Visitors

Following the visit to the *Toronto Star*, the members of the convention were the guests of the Hinde and Dauch Co. Ltd. and the Gair Co. (Canada) Ltd., at a delightful luncheon in the Royal York Hotel. In his address of welcome, L. F. Winchell, vice-president and general manager of the Hinde and Dauch Co., reminded his hearers that the consumption of board in Canada was greater both in volume and value than that of newsprint and all other kinds of paper together. He referred to co-operative research at the Pulp and Paper Institute in Montreal and said that the board industry had been participating actively in this work for less than a year, but welcomed the opportunity to share in the benefits from co-operative research. G. W. Brown, vice-president and general manager of the Gair Company (Canada) Limited, joined with L. F. Winchell in extending a welcome to the delegates, bringing down the house with some witty sallies in lighter vein. L. C. Anderson, Chairman of the Technical Section, replied briefly on behalf of the visiting papermakers.

Visit to Paperboard Mills

After luncheon, the delegates were driven to the plant of the Hinde and Dauch Co. Ltd., where they first visited the carton plant. A roll of corrugating board was fed into a corrugating machine and pasted between sheets of test board fed from two other rolls. The pasted sheet was dried on drum dryers, cut into suitable sheets, creased, printed, cut and sent to the stitchers where the boxes were set up and stitched. Cartons for several well known brands of food products were seen in process. Leaving the carton plant the visitors descended to the breaker beaters where waste paper and pulp are slushed prior to refining and screening, some hand sorting and inspection being carried out by the beater men. Metal and strings are removed in the breakers. A seven-cylinder board machine with ninety-six dryers in eight stacks of

Group of delegates attending the summer meeting of the Canadian Technical Section

Left—The caravan at Hinde and Dauch Co., Ltd., Toronto. Right—(left to right)—F. F. Arnoldi, Hinde & Dauch, Ltd.; H. J. Rowley, Anglo-Canadian Paper Mills; J. C. Nutter, Gair Co. of Canada, Ltd. Left rear, W. G. MacNaughton, Bjorne Johnson and a friend

twelve each, trimming 110 inches was operating on test board. The speed of the machine was about 275 feet per minute, but speeds of 400 feet per minute can be attained on lighter weights. The capacity of the machine on chipboard is 125 tons per day. The vats containing the cylinder moulds are of bronze and present a neat appearance. The machine was built by Downingtown in 1929. A smaller machine was seen making No. 2 patented coated board for folding cigarette boxes which are more widely used than paper packs in Canada. The Gair Company's plant was also open for inspection.

Visit to a Specialty Board and Box Plant

The visitors were then taken to the plant of Firstbrook Boxes Limited, a Gair subsidiary at Weston near Toronto. Here the delegates saw the manufacture of asphalt-filled wrapping paper, gummed paper and tape, linen backed wrapping and folding corrugated wrapping. The last consists of a corrugated board pasted to a single liner and scored across the corrugations forty-five degrees either way so that the sheet can be folded over a corner. The visitors next watched the operation of printing and stamping blanks for cigarette boxes and similar small containers. Ordinary flat-bed printing presses were used for these operations. The folding and pasting machines were ingenious and almost human in their dexterity. Following the inspection of the plant, light refreshments were served in the company's cafeteria, and the visitors entertained by G. W. Brown of the Gair Company, who enjoys a well deserved reputation as a raconteur and kept his hearers in gales of mirth. After some words of farewell by L. C. Anderson, on behalf of the guests, the members of the Technical Section took the train for Niagara Falls, Ontario, a special diner being attached to the train for their convenience. On arrival the delegates were accommodated at the General Brock Hotel.

Practice in European Mills

On Thursday, June 10, the morning was devoted to committee meetings until eleven o'clock, when the members gathered to hear Frank J. Lang, of the Tonawanda mill of International Paper Company, describe European practice as he had seen it during a recent visit across the Atlantic. Without naming the mills which he had seen in operation, Mr. Lang gave a rapid summary of outstanding variations in European practice offering advantages for users in America. Economic nationalism had compelled great economy in cellulose consumption to liberate stocks for war-use. In several countries an actual shortage of cellulose for war uses was being faced and subsidiary sources were being explored. European practice was characterized by great attention to water purification and to cleanliness of wood. Densely populated manufacturing areas naturally require stream pollution control, but water purification is regarded in Europe as a major factor in pulp and paper quality. Besides cleanliness, uniformity of wood chips is maintained at a high level.

A standard refining or beating unit is adopted by many mills. It consists

Left (left to right)—D. B. Chant, Ontario Paper Makers Safety Ass'n; Lorne C. Anderson, Ontario Paper Co. and Chairman of Technical Section; A. E. Cadman, secretary-manager CPPA. Right (left to right)—John Traquair, Mead Corporation, about to run the cup; G. I. Hoover, Provincial Paper; E. J. Calnan, Ontario Paper; J. Edwards, CPPA; C. A. Sankey, Ontario Paper Co.

Left—Dr. A. V. Farr, Stevenson-Kellogg, watches G. L. Larocque, Forest Products Laboratory, on the last green. Right—A tense moment. Chairman Lorne Anderson sinks a putt on the 18th

of a beater for breaking or slushing only, followed by three jordans in series. Using a chest after the beater the unit operates continuously. Where groundwood is added great care is taken to use groundwood of constant strength and freeness and uniform in fibre length. Considerable importance is attached to securing good mixing in machine chests. Vertical propellers were considered satisfactory and were so mounted as to eliminate dead spots in rectangular chests. In some cases a sort of bucket conveyor was used to mix heavy stock.

Centrifiners were preferred in many cases to riffiers and were used in at least one instance to replace the screens on the paper machine. Stream lining of flow boxes was given much thought and bronze construction followed by a slice of the Van de Carr pattern was not uncommon. Perforated flow-evener rolls were mounted in the flow box at the bottoms of baffles.

The efficiency of stock pumps had received much attention by designers, 85 per cent to 90 per cent being frequently attained as compared with 60 per cent in older designs.

Dampening devices are employed in rewinding just before the reel, the aim being to carry high moistures—up to 8 per cent in newsprint. This impairs finish but appears to give good printing properties besides increasing output to some extent. Spray nozzles operated with compressed air supply either hot or cold vapor as desired.

It is noteworthy that carbonate fillers do not appear to be favored in European practice. Reasons for this were not stated.

In reply to a question by J. N. Stephenson, *Pulp and Paper Magazine of Canada*, it was stated that specifications for paper in Europe were being increasingly based on a combination of Bekk smoothness and tensile strength. Per cent stretch to rupture was also used as an index of behavior in fast printing presses. Breaker stacks were not in common use in Europe, merely smoothing rolls. Answering D. McCrone of E. B. Eddy Company Ltd., Hull, Que., the speaker said that from one-half to two-and-a-half per cent moisture was added in dampening. Light drying was considered preferable but it was difficult to prevent over-drying which could be corrected by dampening. John Traquair, of Mead Corporation, Chilicothe, cited an English machine making news at 1400 feet per minute. The sheet was reeled damp and supercalendered. The finished moisture was believed to be 9 per cent with 6 per cent clay. The speaker said that it was easier to reel without calendering and supercalender later, resulting in less breaks and snap-offs and both better bulk and surface. Newton Candee, Howard Smith Paper Mills Ltd., Cornwall, asked if black spots were encountered. The speaker said that using two nips and 4-4¼ per cent moisture subsequently dampened to 5¾ per cent to 6 per cent satisfactory results were obtained on some papers. Less crowning is required and if moisture is to be raised this must first be cared for or trouble will result owing to the greater bulk of the sheet. John Traquair asked for information concerning the use of a wet felt for dampening as compared with a spray. It was stated that both the arc of contact of the felt with the paper and the moisture content of the felt could be readily adjusted by shifting adjustable felt rolls or increasing the pressure of squeeze rolls or increasing felt had been wetted. After a few words of thanks from L. C. Anderson on behalf of the Technical Section the meeting adjourned for luncheon.

Weldon Medal Awarded at Luncheon

At the Technical Section Luncheon held on Thursday at the General Brock in Niagara Falls, Ont., the I. H. Weldon Medal presented by A. L. Dawe in memory of Mr. Weldon was awarded to R. J. Chambers, of the Anglo-Canadian Pulp and Paper Mills, Quebec, Que., for his paper at the annual meeting of the Technical Section in January, 1937, on "Factors Affecting Dryer Performance." L. C. Anderson, in making the presentation on behalf of Mr. Dawe, who was unable to attend, said that this was the first time that this medal had gone to a man with less than three years experience in the industry, but that Mr. Chamber's paper was outstanding among a collection of remarkably good papers presented at the same meeting. A message of regret from A. A. McInnis, Anglo-Canadian Pulp and Paper Mills, Ltd., president of the Canadian Pulp and Paper Association was read to the meeting.

Annual Golf Match

After luncheon, the members of the Section were taken to the Font Hill Golf Club, one of the most difficult and attractive courses in Canada, where the annual match for the R. A. McInnis trophy was played. The links were crowded with threesomes and foursomes exhibiting many styles of golf and varying ideas on training regimes.

After the match, members gathered in the nineteenth hole until dinner was announced. Right from the cocktails the dinner got away to a harmonious start, with J. N. Stephenson as choir leader assisted by a lively orchestra and seventy leather-lunged papermakers. The only speech was made by L. C. Anderson, Chairman of the Section, as he presented the R. A. McInnis Trophy to N. C. Hobson, Canadian Industries Ltd.

Delegates Visit Various Mills

On Friday, June 11, the delegates were provided with a wide range of plants to visit. One trip included the newsprint mill of the Ontario Paper Co. at Thorold, supplying the *Chicago Tribune*, at which were on view a jacketed sulphur burner, a Noble and Wood mill handling groundwood tailings, a carbonate filler plant, and the Fair system for furnishing filler direct to the wet web on the fourdrinier. To provide a touch of variety, this trip included a visit to the Cyanamid plant at Niagara Falls where a wide range of fertilizers are made from atmospheric nitrogen "fixed" by union with calcium carbide in electrical furnaces. The nitrogen is provided by a huge liquid air plant, boiling up through a separating

column at a temperature of some 300 deg. Fahr. below zero. Liquid air will freeze a rubber ball so hard that it can be broken like glass and this was demonstrated to visitors at the plant.

Another trip took in the fine paper, coated paper and tissue mills of Alliance Paper Mills, Ltd., Provincial Paper Mills Ltd. and Interlake Tissue Mills Ltd. at Merritton and Thorold. This gave an opportunity for newsprint and pulp mill men to visit a different operation than their own.

Still another trip included the wire-weaving plant of Niagara Wire Company, where a loom is maintained for nearly every size of machine, in fact, in many cases one loom is kept for one machine alone.

The method of making wires endless by gas-welding the ends of the wires together was witnessed, as well as the rolling of wires after weaving to flatten the contact with table rolls and so reduce wear. Another plant included in this visit was the Weed Chain Company's plant where tire and other chains are manufactured.

After luncheon, the meeting divided into those who wished to visit the Tonawanda mill of International Paper Company on the American side of the Niagara River, while the remainder were taken to the refinery of the International Nickel Company at Port Colborne, Ont. Here a copper-nickel "matte" rich in nickel was refined to recover pure nickel for the market. Nickel and copper occur in the Sudbury area as sulphides, but by adding sodium sulphide to the smelt. The solubilities of copper and nickel sulphides in sodium sulphide are so different that a considerable separation is thus effected, and the nickel-rich concentrate sent to Port Colborne where it is ground, washed, dried and roasted with air to burn out sulphur. Two methods of roasting are used, one a sort of open hearth furnace and one a moving grate passing slowly through a short furnace. Nickel oxide formed at this stage is shipped to Germany and elsewhere in considerable quantity. The oxide is then reduced with coke in open-hearth furnace being cast into crude anodes. These are sent to electrolytic cells where the crude anode dissolves in nickel sulphate and is replated on clean nickel cathodes, copper and precious metals going to the bottom of the cell as a sludge. The pure nickel is then re-cast as ingots either pure or with additions to form alloys. The plant produces about 240 tons of pure nickel a day worth about $560 per ton. After the visit, the delegates were guests of the International Nickel Company at the company's club house, and after light and welcome refreshments had been served, L. C. Anderson thanked the International Nickel Company for its kind hospitality. The meeting then returned to Niagara and dispersed after a very pleasant and profitable sojourn in the Niagara Peninsula, the meeting being one of the most enjoyable summer meetings which the Section has ever held.

Emulsified Lacquers and Their Applications to Paper

L. JAY SMITH
Roxalin Flexible Lacquer Co., Inc.

PAPER and other porous materials can now be effectively coated by the use of a new finish which will not be absorbed by or stiffen the coated article, but will form a flexible, adherent and attractive surface. This material is a lacquer emulsion (emulsified lacquer).

Constitution and Properties of Emulsified Lacquer

A lacquer emulsion consists of an extremely viscous, dough-like lacquer base dispersed in a relatively small percentage of water. It has a very high solids film-forming content, and it also permits the use of nitrocellulose of much higher viscosity which, in turn, produces a film of even greater strength.

Lacquer emulsions can be applied by the ordinary shop methods, such as machine coating, spraying, brushing, dipping, or by swabbing, or by the use of a spreader blade known to some trades as a "slicker."

The cost of the emulsified lacquer will vary, naturally, with the formula. Usually, due to its high solids content, a ready-to-use emulsion will cost more per gallon than a corresponding solution type lacquer. Per pound of solids applied, however, it is very likely to cost less.

Frequently, less emulsion than ordinary lacquer is required for the same job. In place of the usual expensive solvent thinners used for lacquers, the emulsion can be thinned out with a very small quantity of water.

The writer does not hold that emulsified lacquer is a cure-all or that it will displace all other lacquers. It can, however, be used to finish many types of products which have in the past been considered unsuitable or uneconomical to finish, and in many cases, it will also improve the existing finish.

Almost any type of lacquer with the correct properties and merits for specific jobs can be adapted to emulsification for the following purposes:

1—To produce a finishing material that will permit the application of a heavy single coat.

2—To produce a surface coating that will not be absorbed by a porous material.

Advantages

Experience has shown that a much thicker coating of lacquer emulsion can be applied by the spray gun without sagging than is possible with the ordinary lacquer solution. A heavier coat may be applied in any application method principally because of the lighter solids content of the emulsion. The dry film from an emulsion will be heavier than the dried film from a usual lacquer of the same wet coat thickness.

Lacquer emulsion can be made in great variety. Formulae can be altered by blending a lacquer emulsion with an emulsion of another material, such as wax.

Lacquer emulsions of widely different properties can be blended to produce a final film equal to that of a solution composed of the combined ingredients. For example, it is possible to add resin solutions by stirring them into the emulsion. Wall board and papier mache which is to be covered with paint or varnish will absorb practically none of these materials if first given a light sizing coat of emulsified lacquer. Carefully selected dye solution may be added at the time of use, making possible a wide variety of colors from one base material.

By the use of emulsions, it is possible to apply a surface film upon material of extreme porosity. Take, as a case in point, blotting paper, which, if unsized, would readily absorb the usual lacquer solution.

The presence of water in emulsion does not imply that dried films from emulsified lacquers are different in any aspect from typical lacquer films. They possess gloss, flexibility and adhesion in ratio to the skill with which, like lacquers, they have been formulated.

The increased interest in easily disposable paper containers for the packaging of lubricating oil has developed a need for an oil resistant coating material. By finishing the interior of these containers with a fluid lacquer emulsion, a durable leak-proof coating is produced that allows the oil to drain more readily than from either metal or glass.

For paper or fibre board a much more open matte can be used and the usual sizing coats can be eliminated. Emulsion coated papers have shown themselves to be remarkably free from the tendency to block.

◆ ◆

◆ Stonite Patent Upheld in Germany

The validity of the American and foreign patents on the widely known "Stonite" press rolls for paper making machines has recently been upheld by a far reaching decision rendered in the Courts of Germany, according to recent dispatches from Germany.

One of the basic points upon which the decision was reached, it is stated, was that the protective range of the "Stonite" patent made it immaterial, as a matter of law, whether the infringers used pulverized natural stone or an artificial stone, for in the use of this equivalent material for the manufacture of rolls for the identical purpose of application lay the patent infringement.

In view of the large number of "Stonite" rolls now in service throughout the world, this decision is of considerable interest.

Paper Sales Reach an All-Time High Mark

The information on this page is quoted from a survey of the paper industry recently published by DUN & BRADSTREET, INC.—*Editor's Note.*

LAUNCHED from the peak positions attained by some divisions in 1936, the paper industry encountered little interference to its progress during the first five months of 1937. No particular source contributed to the extension of the improvement for the fifth consecutive year, the spreading demand arising from the expansion of general business and the larger orders from regular customers. Even with the slackened rate of May buying, wholesale volume was 10 to 25 per cent more than in the 1936 five-month period, while the gain in retail sales widened 15 to 30 per cent.

Scarcity of bleached sulphite, because of its greater diversion to the munitions, rayon, and other industries, prevented production from going more than 10 to 20 per cent ahead of the five months of 1936. From the total for the latter period, newsprint output rose 16.5 per cent to a new high at 11.6 per cent over the 1929 peak. For all grades, 1937 paper production has been estimated at 5 to 8 per cent over the record set in 1936 at 11,843,000 tons, as computed by the Writing and Cover Paper Manufacturers' Association, which surpassed the 1929 peak by 6.3 per cent.

Proposed and actual construction of mills, chiefly for the production of pulp, kraft, and newsprint, along the Atlantic and Gulf seaboard thus far this year ran in excess of $100,000,000. Wider price rises are expected this Fall, when manufacturers start operations on pulp contracted above the current basis or on the still higher spot pulps. Labor costs have advanced, most estimates placing payrolls up 15 per cent from 1936 totals.

New Production Peak

Handicapped by inadequate supplies of some types of pulp, many manufacturers were unable to reach the schedules planned for this year. Despite this situation, operations were advanced sufficiently to carry production from 10 to 20 per cent over that for the first five months of 1936. With shipments exceeding new business since mid-May, some of the mills turning out book and writing papers have been catching up on orders. Plants producing magazine, waxed, blottings, blanks, and cellophane still were behind on deliveries.

Rate of output for the five months of 1937, based on paper production reports to the American Paper and Pulp Association, reached a new peak at an average of 90.5 per cent of capacity. This was 14.8 per cent above the previous high of 78.8 for the 1936 period, and 31.2 per cent over 1935 at 69.0. Combined production of newsprint for Canada and the United States in May, according to the compilation of the News Print Service Bureau, rose to 388,235 tons, an increase of 13.0 per cent from the 343,742 tons in May, 1936.

No other month in the history of the industry exceeded this newsprint production total. It passed the former records of 383,686 tons in March, 1937, and 382,172 in October, 1936. The latter was the first to surmount the monthly peak held since October, 1929, at 373,923 tons. Total for the five months also set a new high mark, the 1,864,210 tons going 16.5 per cent over the 1,599,705 in 1936, and 11.6 per cent ahead of the 1929 peak of 1,670,797. It was 43.5 per cent more than the 1932 comparative of 1,299,336.

Sales Volume Expanded

In spite of the new consumption records set down for some grades of paper in 1936, little relaxation in demand has been evident thus far in 1937. Each month wholesalers received more orders than in the corresponding one last year. While generous covering of future requirements early in the year resulted in less pressure in May, wholesale volume for the five months was from 10 to 25 per cent larger than for the comparative 1936 period. In the same comparison, the advance in retail sales ranged from 15 to 30 per cent.

Early in June, the unexpected broadening of orders in some wholesale markets indicated that the usual Summer recession probably would be skipped this year. Demand spread from bonds, ledgers, writings, sulphite, and other grades to bristols, glassine, tags, diploma, envelope, building, and roofing papers. The jump in magazine circulations and the launching of many new publications have kept the movement of books and covers at an accelerated rate.

Commitments for paper specialties and novelties, including cups, plates, towels, crepes, and similar lines set an eight-year high at some centers, as amusement parks and resorts made preparations for record patronage. Rising department store sales and multiplying industrial uses have maintained orders for wrapping and coarse papers at a peak level all year, while the extension of paperboard consumption paralleled the gains in parcel shipments.

Further Price Advances

Wholesale prices have moved up on most lines since the first of the year, the range varying from 5 to 12 per cent. Sulphite grades have advanced steadily, and further rises are in prospect for kraft. To the mark-ups of manufacturers, wholesalers have been forced to add their own wage increases, higher taxes, and heavier distribution costs.

On April 1, some manufacturers advanced from $5 to $10 a ton contract prices on coated, bond, envelope, tablet, gumming, and many uncoated white papers. Effective July 1, an increase of $5 to $10 a ton has been scheduled on book and magazine (except contract), miscellaneous, converting, and waxing papers, due to the shortage of imported pulp.

Marking the third increase from the thirty-year low of $40 touched in 1933, the base price of newsprint for delivery during the first half of 1938 has been lifted to $50 a short ton from the $42.50 set for 1937. For the second half of 1938, the quotation is expected to reach $57, and in 1939 probably $65, the highest since 1929 at $66 a ton.

Failures at Standstill

For the first time since the New Bankruptcy Act became effective, a 77-B application was filed by a paper wholesaler on February 18. With the 2 cases recorded for manufacturers in March, the five-month total for 1937 rose to 3 from 2 in the 1936 period. For the full year of 1936 the total dropped to 2 from 12 in 1935 and from 6 to 1934.

As no paper manufacturers went into bankruptcy during the first five months of the current year, failures virtually were at a standstill. The 3 listed for the period were small wholesalers and retailers, as the combined liabilities were only $28,000. This extended the constant annual reduction from the all-time high of 42 in 1932, which carried the 1936 total down to a record low at 16.

The complete insolvency record of the paper industry from 1927 to May 31, 1937, as compiled by DUN & BRADSTREET, INC., shows:

Year	Number	Liabilities
1927	9	$2,188,500
1928	7	877,600
1929	10	1,929,200
1930	4	1,371,000
1931	11	2,794,208
1932	9	2,577,451
1933	11	2,262,734
1934	9	894,000
1935	2	166,000
1936	5	529,000
1937*	..	.....

(*) January to May, inclusive.

These statistics of failures in the paper industry are exclusive of applications under Section 77-B. From June 7, 1934, when Section 77-B of the New Bankruptcy Act became effective, to June 10, 1937, applications were filed under this section by 22 manufacturers.

Super-Calender Roll Load Indicator

C. D. De MERS, Pulp & Paper Division
Taylor Instrument Companies

THE paper mill superintendent's responsibility begins with the first production unit in the pulp mill, or in the shredding room of a converting plant, continues on through every point in the stock flow line, and doesn't end until the paper has passed through the supercalenders and is finished ready for shipment.

The pulp made may be of the highest quality, uniform in freeness, color and strength; it may be perfectly processed in the beater and jordan; it may be formed, pressed and dried, but unless it is calendered with just the correct nip pressure across the entire face of the rolls, the possibilities of producing a sheet conforming to definite specifications are greatly reduced.

Finishing room operators have been calendering and finishing fine papers for a great many years, and have developed a technique high above the standard of many industrial processes; but it is too much to expect that any man can make allowances for the friction developed at the several points of contact and connection of a standard weight and lever arrangement, and adjust the weight on the lower fulcrum arm so that uniform pressures are carried on the two ends of the rolls.

Our studies of the process made with the idea of developing an instrument that would eliminate the human element in determining the adjustment of the weight in order to carry uniform pressures, were made with a specially designed load element that was installed in the compression pin between the top fulcrum lever and the top roll bearings.

Records made of the pressure exerted on the top roll bearing, by the weight as adjusted without the aid of the instrument, furnished some interesting information on the great variations possible, which in some cases was as great as 16,000 pounds between one side of the calender and the other.

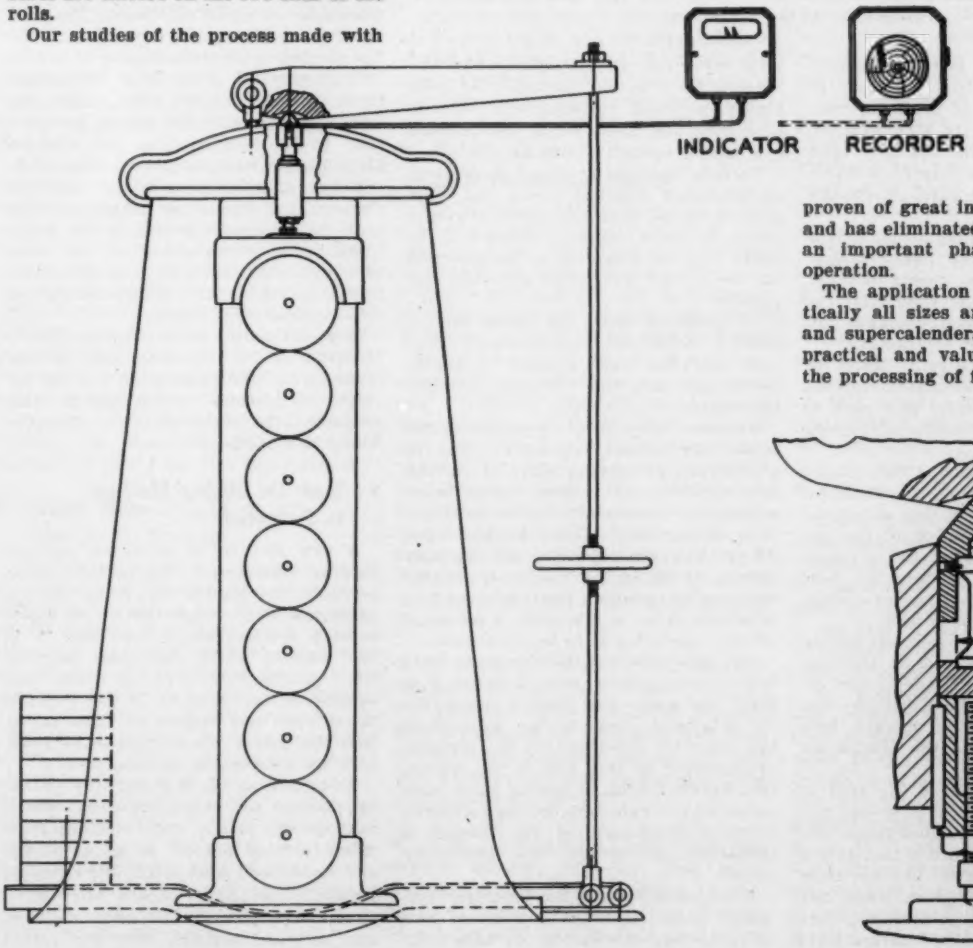
The importance of this last processing unit in a paper mill is obvious, and as the roll pressure is the main variable and actually determines the characteristics in finish resulting from the process, it is equally as obvious that the weight adjustment must be carefully and accurately made if satisfactory results are to be obtained.

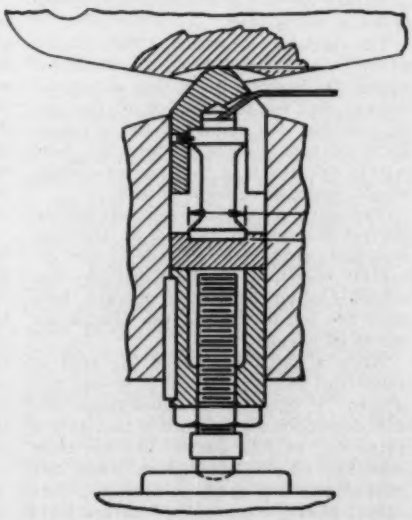
If the roll pressure is greater than the amount necessary for a definite finish, it increases the power required and is responsible for a great percentage of the usual trouble with bearings. Uneven pressures on the two ends of the calender roll cause uneven frictional wear on the intermediate rolls, and an excessive replacement cost. Roll pressures uniformly adjusted to a point just high enough to produce a certain finish eliminates excessive pressures, uneven frictional wear, makes possible a definite finish at the lowest possible conversion cost.

The first instrument developed for this application was of the bi-recording type. This was necessary in order to compile records of roll pressures as adjusted without the use of the instrument, and later with the instrument in checking operating costs.

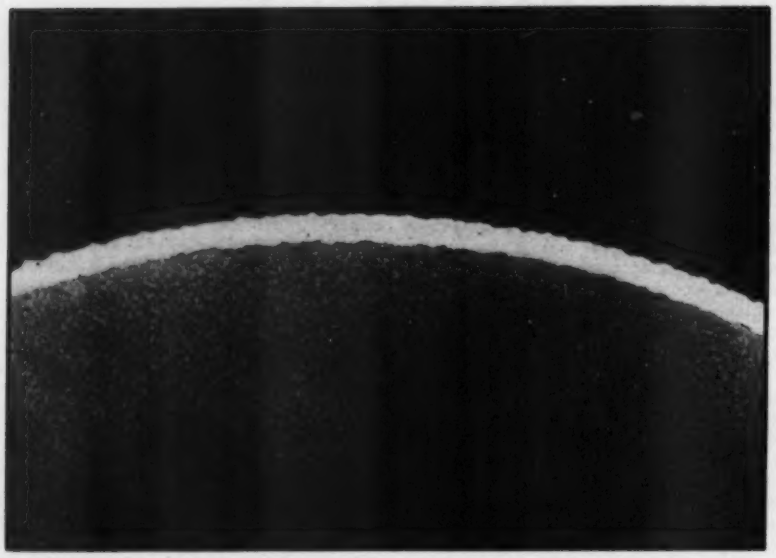
A well-known specialty mill operating a number of supercalenders was interested in the possibilities of a bi-indicating type which encouraged us to develop the non-recording instrument that has proven of great interest to the industry and has eliminated all guess work from an important phase of supercalender operation.

The application is adaptable to practically all sizes and types of calenders and supercalenders, and we believe is a practical and valuable improvement in the processing of fine paper.





New Motion Picture Depicts Lubrication in Modern Industry



Microphotograph of the highly polished metal of a bearing and journal. Note that even these highly polished metal surfaces are covered with tiny hills and dales not discernible to the naked eye

A UNIQUE motion picture dramatization of lubrication methods in modern industry, one of the most comprehensive studies of its kind ever attempted, was shown for the first time recently in the preview theatre of Radio City Music Hall, Rockefeller Center, New York.

More than 100 representatives of the trade press saw the first public screening of the new film as guests of P. M. Gordon, Manager of the Industrial Department of the Socony-Vacuum Oil Company, producers of the picture.

The new film is done in a "March of Time" style. Unusual animated drawing and striking photography are used to illustrate correct lubrication of various types of machinery.

The picture is called "The Inside Story." A microscopic film of oil assumes the hero's role in this industrial drama. But for this film of oil, the picture points out, many of the common daily conveniences of modern life, now within the reach of millions of people, would never have been possible.

The story of the fundamentals behind correct lubrication is told by showing bearings, gears and cylinders—the essential elements of all machines—and demonstrating how they operate, how they are lubricated and the lubrication needs of various types.

After a quick review of the field of industrial and mechanical progress, presented in effective photomontage, the film demonstrates the need of lubrication to protect moving parts. The spectator sees the results of friction when two highly polished surfaces move on each other. Microphotographs, enlarged until they cover the whole screen, show the reasons for friction, the fact that even highly polished surfaces are covered with hills and dales which the unaided eye cannot see.

Various bearings are then shown and an animated drawing shows just what goes on inside, how lubrication prevents metal to metal contact. Factors to be taken into consideration in the selection of the proper lubricant are fully explained.

In a similar way, the lubrication of gears is illustrated with animated drawings showing how a gear transmits power and how the lubricant provides protection.

Another series of pictures shows the work that correct lubrication does in protecting the moving parts of various prime motors—the Diesel engine being selected as an example. Animated drawings make clear the principle upon which the engine operates and the manner in which explosions are translated into usable power. Further drawings illustrate what a lubricant must do if efficient operation is to be maintained.

The new film will be shown to business organizations and to groups of plant managers and factory executives in industrial communities throughout the country, according to Mr. Gordon. "Production of this film is the answer to a growing demand among plant managers for a simple, complete and straightforward discussion of the subject of industrial lubrication," Mr. Gordon declared.

"For many years it has been the Company's practice, as leaders in the field of industrial lubrication, to keep engineers on the road, visiting various industrial plants, and giving illustrated lectures on the lubrication problems which confront plant managers. With industrial expansion, newer types of machinery and increased production, the demand for this type of service is growing rapidly. The new film represents the most modern and effective way of presenting the subject, and permits us to reach a much larger audience than heretofore.

"It is expected that 'The Inside Story' will go a long way toward making the whole matter of correct lubrication more clear to the plant man who depends upon it for his daily livelihood, or the plant owner looking for increased profits from the business in which he is engaged."

◆ ◆

◆ N. Y. Tappi Unit Elects Officers

Watertown, N. Y., was the scene of a recent meeting of the Provisional New York State Section of TAPPI at which time officers for the fiscal year of 1937-38 were elected.

About 100 members participated in the election of Prof. C. E. Libby, New York State College of Forestry, as chairman. John H. Rich, Newton Falls Paper Company, Newton Falls, N. Y., was elected vice-chairman and F. G. Calkin, The Solvay Process Company, Syracuse, N. Y., was elected secretary-treasurer.

In preparation of the later petitioning of the national TAPPI organization for a charter, a constitution for the new section, to be designated as the Empire State Section, was presented and adopted.

Following a luncheon at the Jefferson County Golf Club, the afternoon was spent by the men in golfing on the club's links or in trapshooting at the local skeet club. Arrangements for entertaining the ladies included bridge and a river trip at Alexandria Bay.

Concluding the day's program, B. D. Millidge, of the Howard Smith Paper Mills, Ltd., Cornwall, Ontario, spoke on "Human Relations" and Homer M. Rice presented the du Pont film, "Wonder World of Chemistry."

◆ New De-Inking Method Is Patented

A new method of de-inking and defibering wastepaper has recently been patented by Harold D. Wells of the American Paper Machinery and Engineering Works, Inc., Glens Falls, N. Y. The patent, which has been pending since September, 1932, protects him against infringement on 26 new ideas of the process and apparatus. The invention, the patent office indicated, is available for commercial development.

According to the inventor, the de-inking process for producing clean, white, high quality pulp of great strength from waste printed papers, is an automatic and continuous mechanical and chemical process. The waste papers, after being dusted, are pulped, de-fibered, de-inked and screened through very fine screen

plates with .074 inch perforations in a single machine having a weak detergent solution.

Through the thorough de-fibering, de-inking and fine screening, high quality pulp of fine even texture without flakes is produced. The selected economical proportions of waste papers, detergent and water are automatically regulated and maintained uniform. Unusually low power costs are effected by the use of Diesel engines which furnish all heat needed in the process. By a novel use of warm water, no steam is used and as the system is automatic and continuous, maximum savings in labor and other costs may be maintained.

◆ Union Bag Operating Second Unit

The second unit of the Union Bag and Paper Corporation's new paper mill at Savannah, Ga., went into production recently, according to a statement issued by Alexander Calder, president.

The new unit, designed to produce 40,000 tons of kraft paper annually, will duplicate the capacity of the first unit which went into operation during last July. It is expected that the latest addition will result in an estimated saving to the company of an additional $1,000,000 a year as compared with buying paper in the open market or making it in the North. Construction of the second unit was begun in October, 1936, and was completed on schedule at a cost of approximately $2,750,000. It was stated that construction of a third unit is now under way and should be completed early this fall.

"The completion of the new unit at Savannah is the second major step in our program of self-sufficiency in the matter of our pulp requirements," Mr. Calder said. "When our third Savannah unit goes into production in the fall, we shall be practically independent of outside sources of either kraft pulp or kraft paper at a saving to us of approximately $3,000,000 annually on today's market. It was originally estimated that each unit at Savannah would afford the company savings of approximately $1,000,000 a year. The operation of the first unit to date has amply justified this forecast."

◆ Graff Now President of Joseph T. Ryerson

First Vice-President Everett D. Graff of Joseph T. Ryerson and Son, was elected president of the company at a recent meeting of the board of directors. Mr. Graff has been with the Ryerson organization for thirty-one years, having come with the company immediately upon graduation from college in 1906.

Edward L. Ryerson, Jr., is chairman of the board of the Ryerson company and vice-chairman of the Inland Steel Company. W. F. Kurfess, assistant vice-president, was elected vice-president and V. H. Dieterich, assistant vice-president, was also elected vice-president. Ainslie Y. Sawyer, formerly assistant vice-president, was made assistant to the president.

◆ Two New Units for Johns-Manville

Negotiations for the acquisition of two new properties by the Johns-Manville Products Corporation have recently been completed, according to an announcement by Lewis H. Brown, president of the Johns-Manville organization.

In Watson, a suburb of Los Angeles, an option to purchase a 50 acre plot of land has been acquired and construction on the first unit of a new million-dollar factory there will begin as soon as possible. This new plant will produce rock wool home insulation and Transite asbestos-cement pipe.

When completed early in 1938, the new plant is expected to employ about 300 men, Mr. Brown said. Initial plans call for the erection of two cupolas for the production of rock wool insulation while facilities for the Transite pipe production will be installed as quickly as possible.

The second plant for Johns-Manville was announced upon the completion of negotiations for the purchase of the Richmond, Ind., plant of the Fibre Conduit Company. About July 1st, Johns-Manville intends to begin the installation of equipment for the manufacture of a new type of low temperature insulation recently perfected in the J-M research laboratories.

The construction of the new factory at Watson, Calif., and the establishment of the Richmond plant will provide this company with a total of twelve plants in operation in the United States.

◆ Safety Council Has New Calendars Ready

The National Safety Council's attractive and instructive calendars for 1938 are now ready for circulation. Thanks to suggestions and comments from the council's members plus the development of modern printing art, this new edition is claimed to be the finest ever produced.

In addition to the fine art work incorporated in the calendars, an interesting new "Crusader" feature has been attached this year. With every calendar there will be a two page examination paper in which fifty fundamental safety questions are asked. The answers can be found somewhere on the calendar. Anyone completing this examination and answering the questions 80 per cent correct, will receive a certificate of enrollment in the "National Safety Council Crusaders."

◆ JOSEPH D. BENNETT, of the Dilts Machine Works, Inc., Fulton, N. Y., was married recently to Miss Virginia Hunter, teacher of dramatics and English at the Fulton high school. Mr. and Mrs. Bennett are now in Europe. They will reside in Fulton.

◆ WM. J. WALKER, who since December of last year has been plant manager at the Pulp and Paper Laboratory, Savannah, Georgia, has become associated with the Johns-Manville Corporation at Oswego, New York. At Savannah, Mr. Walker succeeded W. G. MacNaughton, who returned to his former post as Engineer of the News Print Service Bureau in New York.

◆ New De-inking Process Being Introduced

A new de-inking process has recently been invented by Dr. F. W. Hochstetter, well known Pittsburgh chemist and applied science engineer. The chemical compound employed in this process is non-poisonous, non-corrosive and contains no chemicals now in use in any paper mill operation. It is free of soaps, oils, caustic soda or soda ash. It is claimed that this process will de-ink within one hour's time without attacking the fiber. Further claim is made that the pulp produced is of an excellent quality, almost equal to virgin pulp. It is definitely asserted by the inventor that this process eliminates the bleaching operation on sulphite papers, as it restores the stock to its original color.

The patents of this process are owned by the T. & H. Enterprises, Inc., which is backed by J. C. Trees, Pittsburgh industrialist. This company, together with E. H. Silberman, of the E. H. Silberman Paper Company, Cleveland, Ohio, have formed the Silco Pulp Products Company, 1836 Euclid Ave., Cleveland, which company has exclusive rights to market this process for de-inking waste paper to paper mills.

The equipment for handling this process consists of a series of a few specially designed tanks. These are not expensive and are attached to the beater chest of a paper mill. The stock is pumped from the beater chest into the series of tanks, usually three, where it is de-inked and washed as fast as the beater can handle the raw stock, all with one continuous operation. Hot water is required in one tank only; cold water is used in the remainder of the operation.

The Silco Company bases the value of this process on the fact that re-sorting of waste paper at the mills can be eliminated.

◆ Glenn E. Townsend

Glenn E. Townsend, head of the order department of the Rex Paper Company, Kalamazoo, Mich., passed away June 27 following a short illness. He was 59 years of age. Although he had not been in the best of health for two years, Mr. Townsend carried on his work until about a month ago.

Mr. Townsend's experience in the paper industry covers a period of more than 30 years. He was among the pioneers in the Coated Paper Industry in the Kalamazoo valley. His first connection was with the old Riverview Coated Paper Company. In 1912 he went with A. L. Pratt and John F. King of the King Paper Company where he was in direct charge of the Coating Division, a new venture of the company. He remained in this connection until 14 years

ago when he became associated with the Rex Paper Company.

The only member of his family surviving is a daughter, Miss Virginia Townsend of Kalamazoo.

◆ Russell T. Gray

Well-known in the field of industrial advertising as president of the company which bore his name, Russell T. Gray passed away recently at the age of forty-five. Mr. Gray was active president of Russell T. Gray, Inc., since the time of its formation in 1917 in Chicago.

Besides his widow, Mr. Gray is survived by a son, Robert, and a daughter, Betty. Mr. Gray's parents and two brothers also survive.

◆ John H. Hibbs

Widely known among many paper mill executives in the United States and Canada, John H. Hibbs, manager of the Paper Makers Chemical Corporation, Ltd., Freeman, Ontario, passed away recently at the age of forty-five.

Born in Doylestown, Pa., Mr. Hibbs was a graduate chemical engineer of the University of Pennsylvania and had held technical and executive positions in many paper mills before becoming affiliated with PMC. He had been manager of the Canadian plant since 1931.

T. G. Batchelder, who has had considerable experience in the sizing industry, succeeds Mr. Hibbs as plant manager.

◆ J. Wallace Tower

Prominent for many years as a consulting engineer, J. Wallace Tower, partner in the firm of Hardy S. Ferguson and Company, New York, passed away recently at the age of sixty-six.

Mr. Tower was born and educated in Holyoke, Mass., and commenced his engineering career with the firm of D. H. and A. B. Tower, consulting engineers and architects of Holyoke. In 1898, he was engaged by Hardy S. Ferguson to assist in the design and construction of the Great Northern Paper Mills at Millinocket, Maine. Mr. Tower became a partner in the firm of H. S. Ferguson and Company in 1928. His most recent engineering work was the design and construction of the pulp and paper mill for the Crossett Paper Mills.

Funeral services were held at the residence in Holyoke and interment was in Forestdale Cemetery, that city. Mr. Tower was unmarried and was the last surviving member of his family.

◆ Mrs. L. D. Post

Widely-known throughout the pulp and paper industry in her capacity as president of L. D. Post, Inc., publishers of *The Paper Mill*, Mrs. L. D. Post passed away June 13 at her home in Sea Girt, N. J.

For many years Mrs. Post had accompanied her husband to conventions and sectional meetings and on the latter's death she made the affairs of his publication her principal interest. Mr. Post, founder of the magazine, had been its publisher for more than a half century.

Mrs. Post was laid to rest beside her husband in Prospect Hill Cemetery, Caldwell, N. J., after a simple funeral service at the Post residence in Sea Girt.

This rotary lime kiln shell is one of two shipped recently to a Southern kraft mill by Allis-Chalmers Manufacturing Co. Each of these shells was 9 ft. in diameter by 125 ft. long and weighed 144,000 pounds

◆ Rubber Lining for Tanks

United States Rubber Products, Inc., 1790 Broadway, New York, has announced that its Permobond linings are now available for a wide range of service. These linings, providing resistance to corrosion, diffusion, abrasion and electrical conductivity, are engineered to fit individual requirements — the rubber used for them being compounded to meet the specific problems of the job and then bonded to the metal surface in such a manner that it is practically an integral part of the metal itself. They are recommended by the manufacturer for the handling of hypochlorite solutions and chlorine water, for all inorganic acids except strong oxidizing acids, for most organic acids, for inorganic salt solutions and for inorganic bases.

◆ Synthetic Insulation for Cable

A new synthetic insulating compound has been introduced by the General Electric Company, Schenectady, N. Y., under the trade name of Flamenol. This compound, similar to rubber in its characteristics, but containing none, is noncombustible, is highly resistant to moisture, acids, alkalies and oils, has excellent aging characteristics, and is strong mechanically. Cable insulated with it is recommended by the manufacturer for power and control circuits at 600 volts and less, and for operation at a maximum copper temperature of 60 deg. C. For most applications, this cable, which is available in a variety of colors for circuit tracing, is used without any protective finish, such as braid, lead or armor.

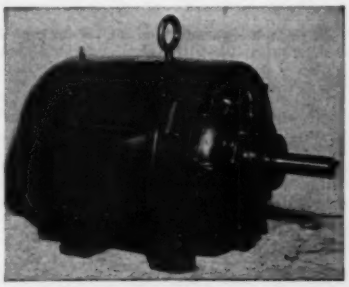
◆ Bolt Threading Machine

A bolt threading machine designated as an improved No. 915 single spindle "Rapiduction" machine, has been developed by The Oster Manufacturing Company, Cleveland, Ohio. This machine has a bolt range that covers all sizes from ⅜ in. to 1½ in. at spindle speeds ranging from 49 to 298 r.p.m. Among the features of the machine cited by the manufacturer are: Timken bearings throughout; die-head of hardened and ground tool steel; dies of high speed steel; spindle of high carbon steel forgings, heat-treated and ground; spindle mounted on pre-loaded and adjustable tapered roller bearings; driving and change speed gears of chrome nickel steel, heat-treated and ground, and run in oil; headstock shaft of high carbon steel, heat-treated

and ground, and mounted in tapered bearings, automatically lubricated and adjustable for wear; vise-carriage of semi-steel rigidly supported with both lateral and vertical adjustments for wear; and guards for all moving parts that might cause injury.

◆ Fan Cooled Squirrel-Cage Motor

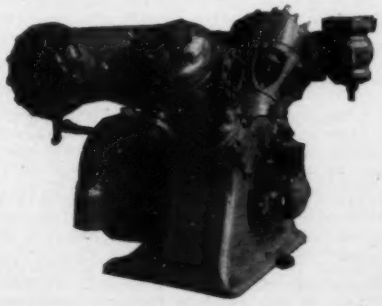
A new design of dual ventilated, fan cooled, type CS, squirrel-cage motor has been announced by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. The motor frame contains two separate sets of air ducts, one internal and the other external, which are separated by a common wall.



An internal fan on the rotor circulates warm internal air through the internal ducts, the walls of which are cooled by an external fan which blows larger volumes of cool air through the external ducts. The housing is designed so that fresh grease enters the outside edge at the top of the bearing and excess or used grease is discharged at the bottom inner edge to an overflow sump. The used or excess grease may be removed readily from the sump through a pipe plug opening. Bearings are of the cartridge type. This motor, designed for use where operating conditions are severe, may be installed outdoors without additional protection.

◆ Air or Gas Compressor

Sullivan Machinery Company, Michigan City, Ind., has developed an air or gas compressor that is made in displacement sizes of 373,480,642 and 800 cubic feet per minute and for which it claims



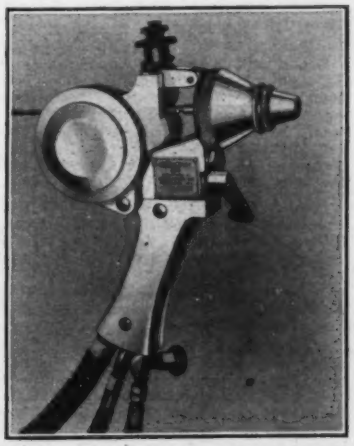
great economy of power, maintenance, investment and installation space. It is a continuous heavy duty machine, which is built for any type of drive but which reaches its greatest efficiency with a built-in motor. A built-in motor equipped compressor in any of its displacement sizes requires only 6 feet by 8 feet of floor space.

Vacuum pumps, boosters for steam or gas, and low or high pressure machines are available in this type of construction.

◆ Metal Spray Gun

A metal spray gun, designated as the Universal, has been announced by Metal-spray Company, Inc., 113 Llewellyn St., Los Angeles, Calif. This gun, which weighs less than 4 lb., has a single control valve which permits acetylene, oxygen, and air to be turned on simultaneously. The valve is of monel and special bronze construction and requires no lubricant. Separate adjustment of acetylene and oxygen is obtained through independent valves. An air ventilated nozzle eliminates back fire. Ball bearings, gears and worms are Alemite lubricated from one point. Power plant and combustion unit are completely separated.

Pounds of metal deposited per hour is in direct ratio to wire size used. With



⅛ in., 12 gauge B & S and 15 gauge B & S wire sizes respectively, steel is sprayed at 8, 5 and 2½ lb. per hour; bronzes at 15, 9 and 5½ lb.; and zinc at 32, 17 and 10 lb. Maximum gas pressures are 15 lb. for acetylene, 17 lb. for oxygen and 60 lb. for air.

The process is used for building up of machine elements and also for the lining of tanks, or the coating of structural members or any other surface. Deposits may be made ranging from $\frac{1}{1000}$ in. to 1 in. in thickness.

◆ Portable Pyrometer

A new millivoltmeter-type portable indicating pyrometer has been placed upon the market by The Bristol Company, Waterbury, Conn. This pyrometer, making use of a cobalt magnet, is said to be unusually sensitive. Its high-resistance millivoltmeter movement is double-pivoted and shielded to prevent the effects of stray fields. Case is of molded Bakelite. The instrument, using a thermocouple and extension leads, is for measuring temperatures up to 3000 deg. Fahr.

◆ Long Tube Mercury Lamps

A modernized series of mercury lighting units of the long tube, Cooper Hewitt type are being introduced by the General Electric Vapor Lamp Company, Hoboken, N. J. One of the units, a 50-in. light source, operates at 350 watts, a.c.; another, a 33-in., operates at 280 watts.

The complete lighting units have an overall efficiency of about 15 lumens per watt.

Both the reflectors and tubes are intended for horizontal mounting. Starting and restarting after any current operation, is instantaneous. All tube connections are made with insulated screw terminals.

These units are suggested by the manufacturer as being particularly suitable for tasks requiring a minimum of shadow and glare and a maximum of detail-revealing clarity.

◆ Acid-Resistant Floor Material

Flexrock Company, 800 North Delaware Ave., Philadelphia, Pa., has announced the development of an acid-resistant floor material for application as a total floor over old or new concrete floors. The product, designated as Rockflux, is the result of combining diabase and quartz through the use of a flux in which calcium and other elements affected by acids are reduced to almost zero. Among the advantages, other than acid resistance, claimed for the product by the manufacturer are: Low cost, abrasion resistance, quick setting, and simplicity of installation.

◆ Washer Punch

A punch for cutting washers out of metal, fabric, gasket material, fibre, steam packing, strawboard, asbestos, leather, felt, cork, rubber, Bakelite, mica and other similar materials has been added to the line of the Ideal Commutator and Dresser Company, 1028 Park Avenue, Sycamore, Ill. The punch will cut washers from materials up to 1/16 inch in thickness, over 150 different washer sizes being obtainable through the use of 18 hardened dies which are supplied with the machine.

◆ Emulsion Preservatives

Glyco Products Company, Inc., 148 Lafayette St., New York, N. Y., has announced two products, under the names of Moldex and Aseptex (Tech.), for retarding mildew, fermentation and mold growth in vegetable gums, casein, glue, gelatine, etc., when used for non-edible purposes. These products are in the form of dry powders which can be used as such or in water, glycerine or alcohol solutions. Both of these products, according to the manufacturer, are finding considerable application in paper as well as other industrial fields.

◆ New Catalogues and Publications

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.—Excellent photography, size charts and sectional drawings illustrate fully the various types of vibrating screens that are manufactured by this company. This 11 page bulletin (No. 1476-A) has some very informative material between its brown and white covers.

Cleveland Tramrail, Wickliffe, Ohio—A loose-leaf folio has been circulated by this company which stresses the advantages of hand-propelled carriers with motor operated hoists. This mechanism is used where the travel distance is not great and where speed is necessary.

Clifton Conduit Co., New York, N. Y.—A deluxe, 60-page book relating to wire cable conduits, is the latest offering of this company. Bound with a stiff cover, this presentation illustrates in a detailed manner the types and usages of Clifton conduits. In addition to the well-worded reading matter, the book is replete with photographs, tables, drawings and charts; all of which make it an extremely valuable guide for those interested in power, maintenance or construction work.

De Laval Steam Turbine Co., Trenton, New Jersey—An interesting brochure which tells the story of how the pumps used in the Louisville (Ky.) pumping station were kept going during the recent flood, is the presentation of this firm. Motor units, manufactured by this company, were used after ten days under 35 feet of water.

Dilts Machine Works, Inc., Fulton, N. Y.—The design, structure and use of the Cowles classifiner manufactured by this concern, is amply described in the latest bulletin distributed by the company. Specifications and features of the classifiner are presented in a clear and concise manner.

E. I. duPont de Nemours and Co., Wilmington, Del.—The properties, usages and qualities of Neoprene, duPont's chloroprene rubber, are fully described in a late publication by this company. Simple in form, this interesting booklet presents accurate facts regarding the product, all of which are illustrated and compared with common rubber. This little book will be of value to every business executive or engineer interested in the utilization of new engineering materials.

Duriron Company, Inc., Dayton, Ohio—The new general catalogue which has been recently issued by this company contains valuable descriptive material regarding the corrosion resisting equipment manufactured by the firm. Bound with an attractive red and black cover, the bulletin illustrates types and designs of equipment for the handling of corrosive liquids and gases.

General Electric Vapor Lamp Co., Hoboken, N. J.—An illustrated bulletin brought out by this company gives facts and figures about the newly improved horizontal Cooper Hewitt lamps. Photographs, engineering data and simply-written statements give the reader a clear idea of the advantages of the product thus described.

Gorton Heating Corp., Cranford, New Jersey—This company has issued a folder (No. 104) which explains the high pressure air eliminator they manufacture. This apparatus is used for automatically venting driers, steam coils, traps, etc.

Goulds Pumps Inc., Seneca Falls, N. Y.—This company has recently issued an extremely attractive and interesting publication which covers the entire field of the industrial pumps which the company manufactures. Through eighty pages, all of the centrifugal, rotary and reciprocating pumps are described minutely and every point regarding their adaptability and usage is illustrated clearly, not only by use of detailed tables and charts, but also by the employment of truly fine photographs and photo-diagrams. The book is bound with a sturdy greyish-blue cover and would be a valuable permanent addition to any industrial library.

Ingersoll-Rand Co., New York, N. Y.—Bulletin No. 1972-B illustrates by use of specifications, dimensional charts and photographs, the Cameron condensate return motorpump.

International Printing Ink Corp., New York, N. Y.—A comprehensive laboratory report on the characteristics and applications of a new blue pigment, Syan Blue B, has just been released by this company. Some of the classifications covered in the ratings are signs and poster inks, process printing inks, parchment inks, offset and tin printing inks, carton inks, rotogravure inks and lacquers and enamels.

Johns-Manville, New York, N. Y.—Two new bulletins which have to do with roofing and other building material have been issued recently by this company. One, entitled, *Bonded Built-Up Roofs,* contains complete detailed specifications regarding roofing material. The other, a smaller publication, has to do with the siding and roofing composition the company manufactures. Both publications illustrate by use of photographs and charts the manufacture and application of the materials.

Leeds and Northrup Co., Philadelphia, Pa.—An interesting bulletin (No. N-96S-744A) regarding corrective water treatment has been published recently by this firm. A description of pH recording and pH control by use of the indicating and recording equipment the company manufactures, is a feature of this bulletin.

Lewis-Shepard Co., Boston, Mass.—A folder which illustrates in a brief but compact manner, the various lift trucks and skid platforms put out by this firm, has been circulated lately by the company.

University of Maine, College of Technology, Orono, Maine—The specialized technical training courses in engineering and chemistry given at this institution for those interested in the pulp and paper industry, are described in a small folder issued recently by the college. Information concerning these courses may be had on request by addressing Dean Paul Cloke of the university.

Metropolitan Life Insurance Co., New York, N. Y.—A little different in theme is the presentation of this company. This booklet, entitled, *Employee Contact Through the Bulletin Board,* shows how easy and effective contacts can be made between employer and employee through the correct use of the bulletin board.

Motor Service and Manufacturing Co., Chicago, Ill.—A broadside which explains the principle of the air circulator this company manufactures has been issued recently.

Myers Engineering Equipment Co., St. Louis, Mo.—A bulletin has been circulated recently by this firm which explains and illustrates the working principle of a special type hoist the company sells.

Nash Engineering Co., South Norwalk, Conn.—A unit type vacuum heating pump for service where a liquid and gas are handled together, is fully described in a recent bulletin brought out by this concern. Rating and dimension tables serve to give the reader a complete picture of the item thus described.

National Safety Council, Chicago, Ill.—A safety bulletin dealing with the dangers of chemical burns and the proper treatment for same, has been distributed recently by the council. Articles dealing with the treatment of the burns are segregated into the various sources of the burns and include: caustic soda, carbolic acid, caustic potash, hydrochloric acid, hydrocyanic acid, lime, metallic salts and phenol.

W. H. Nicholson and Co., Wilkes-Barre, Pa.—A brochure which presents the various types of industrial steam traps manufactured by this firm has been issued lately by the company. Features and operation of the traps are illustrated fully.

Norton Co., Worcester, Mass.—A handy little booklet on the subject of disc grinding which describes the equipment manufactured by this company and which illustrates how the equipment is used, has been issued recently by this firm.

Patterson Foundry and Machine Co., East Liverpool, Ohio—Ninety-six pages of detailed reading matter and excellent photography make up the latest publication of this company. The book is devoted to explaining and illustrating the operation of machinery for clay and mineral working plants and presents a clear picture of the types of machines produced by this company for the latter use. Bound in a colorful, shiny purple, this publication is an interesting and valuable data book to keep permanently.

Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.—A pamphlet dealing with the self-hardening, acid-proof cement this company produces, has been distributed recently. The uses of the cement and important points about its application are brought forth briefly but adequately.

Rockwood Sprinkler Co., Worcester, Mass.—A new union which has strength and resistance to corrosion is fully described in a recent bulletin issued by the company. The new union is claimed by the company to resist oxygen corrosion and dilute sulphuric acid even better than iron.

Stebbins Engineering and Manufacturing Co., Watertown, N. Y.—A bulletin which is devoted solely to the presentation of figures regarding capacity of tanks, table of circles, table of spheres and decimals of a foot, has been issued by this firm. These useful engineering tables may be had upon request.

Worthington Pump and Machinery Corp., Harrison, N. J.—Bulletin L-711-B2 illustrates the horizontal dry vacuum pumps manufactured by this company. Photographs and size lists, together with well-worded written material, gives the reader an accurate idea of the construction and uses of the product.

BOOKS

Procedure Handbook of Arc Welding Design and Practice—The fourth edition of this book includes the latest weld symbols adopted by the American Welding Society in May and a new introduction to part six: "Designing for Arc Welded Steel Construction of Machinery." The new weld symbols occupy sixteen pages in the reprinted handbook and are ideographic; their use as applied to welded design drawings being fully explained. In addition to the symbols themselves, an example is given of how the symbols are actually applied in producing a welded design. Copy of the reprinted fourth edition can be obtained by writing the Lincoln Electric Co., Cleveland, Ohio. The price is $1.50 postpaid in U. S. A.

◆ Extensive Preparations for Sixteenth Chemical Exposition

To meet the increasing world demand for the most improved chemical products and the most advanced chemical processing machinery, the American chemical industry is laying plans well ahead for the Chemical Exposition, which occurs in December. The Sixteenth Exposition of Chemical Industries will be held at Grand Central Palace, New York, December 6 to 11, 1937. Three entire floors of the Palace have been reserved for the event.

The calibre of exhibitors and the amount of floor space under contract indicate that the Sixteenth Exposition will be one of the most successful presentations of its kind ever held. At this time, five months in advance of the Exposition, all space on the first and second floors of Grand Central Palace has been sold to exhibitors and one-fourth of the total available space on the third floor is under contract.

The Student Course in Chemical Engineering which has become an established feature, as conducted during the week of the Exposition, will again be presented. This concentrated course in chemical processes and plant equipment, given in conjunction with the Exposition, provides an unusual educational opportunity. Senior college students are eligible to enroll without cost from any part of the United States. One unique opportunity which the course provides is that of hearing national authorities in chemical engineering who are assembled at the Exposition. Relating what they hear to actual practice, the students have the additional opportunity of studying the greatest collection of actual chemical engineering plant equipment and process machinery which is ever assembled in one place.

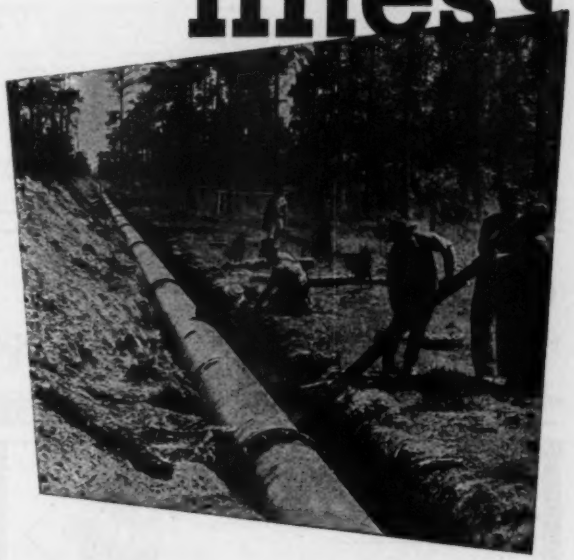
Prof. Harry J. Masson, head of the Department of Chemical Engineering at New York University, is Chairman of The Educational Committee of the Exposition, under whose auspices the Student Course in Chemical Engineering is held. Prof. W. T. Read, Dean of Chemistry, Rutgers University, who has served as Director of the Student Course at previous Chemical Expositions, will this year again be in full charge.

An unusual feature of the Sixteenth Exposition of Chemical Industries will be a slogan contest offering to the winner a prize of $250.00 in cash. The award will be made to the person who submits "the best descriptive expression encompassing the purposes and the benefits redounding to the common good from the activities of the Chemical Industries". As further indicated by the contest announcement, the chemical industries are themselves creative, they establish new industries and rehabilitate old. They create employment within themselves and in other industries, and are the manufacturers of diversified products which are of manifold use. These products serve to alleviate suffering, bring health and well-being, extend civilization, increase nature's productivity, and create national security and wealth. In their peaceful applications, which are of course predominant, the announcement points out, "the chemical industries contribute better than all else to the progress and happiness of mankind". Rules of the contest will be announced at an early date.

The fundamental character of the unit processes of chemical engineering and the diversified uses to which the products of chemical invention are applied serve to connect the chemical industry to all other fields of human activity. The recent Tercentenary of the American Chemical Industries brought to national attention the subject of their work and a realization of their importance. The Sixteenth Exposition of Chemical Industries will emphasize these points in terms of actual materials and machines. Included among the products to be exhibited are chemicals and processing machinery; metals and alloys; brewing, distilling, and bottling equipment; containers and packages; synthetic plastics and molded products; lacquers, varnishes and corrosion resisting surface coatings. Other exhibits will be designed to explain natural resources and industrial opportunities for plant location.

Writing of "Man in a Chemical World," A. Cressy Morrison, author of the new book by that title says, "the many ramifications of this service (chemical industry) to humanity reach out in most amazing ways to affect all our activities".

supply lines?



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2—300 hp Wgse. 360 rpm
2—200 hp G. E. 600 rpm
1—200 hp Burk 900 rpm

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1—300 hp G. E. 360 rpm squir-cage mill motor
Many others in stock

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1—300 hp Al. Ch. 900 rpm
1—250 hp El. Mch. 1200 rpm
1—200 hp Cr. Wh. 600 rpm
1—150 hp Brk. 600 rpm
1—75 hp G. E. 1200 rpm

ENG. GEN. SETS
1—225 KVA & 1-150 KVA, stm

MG SETS
1—500 KW Sync. compl.
2—200 KW Sync. compl.
Many smaller—all capac.

TURBO-GENERATORS
2—1250 KW Condens.
1— 750 KW Condens.

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1—750 Cr. Wh. 600 rpm
1—500 KW El. Mch. 514 rpm
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Good proof of this will be found at the Chemical Exposition this year. The availability of a complete review of the latest developments in a group of key industries is related to the practical value of being able to compare competitive technical achievements applicable to every phase of life and industry.

America holds the leading position in chemical industries and this year after the recent long period of depression there is a strong market representing entirely new plant construction. Then, too, the rehabilitation of obsolete plant equipment is a strong factor in machinery sales. New processes being constantly developed require new factories and new machines. Increased production in old plants calls for modernization. Sometimes the ideal machine for a new process in one industry is already established in the industrial practice of another. Proper selection of existing machines and processes to cope with new manufacturing problems is often a by-product of the Exposition of Chemical Industries.

Attendance at the Chemical Exposition is drawn from all over the world. Admission is by invitation or by registration only. The audience this year will find the arrangement of exhibit material particularly suited to thorough inspection in minimum time. Advance indications, many from exhibitors who plan months ahead, are that the exhibits will be unusually graphic, comprehensive, and clear. Dynamic displays and process equipment actually in operation will constitute one of the most interesting features.

The Sixteenth Exposition of Chemical Industries will be under the personal direction of Charles F. Roth, who has directed each Chemical Exposition since the first one was organized in 1915.

◆ Union Bag & Paper First Half Year Earnings Estimated at $600,000

Union Bag & Paper Corporation is expected to earn around $600,000 in the first half of 1937, according to an estimate made by Alexander Calder, president. This would compare with profits of only $387,391 for all of last year, and almost duplicate a peak profit of $682,405 for the year 1934. According to statements made by Mr. Calder, the profit in the first half of this year was made with one unit of the company's Savannah mill in operation. During the second half year there will be two units operating during the entire period, and three units during the last quarter.

◆ THE TREASURY DEPARTMENT has prepared special notices which have been sent to all employers in the paper industry setting forth the taxing provisions of the Social Security Act. The facts contained therein cover the fundamental requirements found in Titles VIII and IX of the Act. Tax returns should be made by all employers to avoid drastic penalties.

◆ Danish Rayon Staple Industry Planned

Negotiations have been conducted for some time between the Danish Minister of Commerce and a group of financial interests in Switzerland representing the large "Rayon" concern (Societe pour l'Industrie Soie Artificielle of Geneva), which operates rayon and rayon staple factories in a number of European countries, that may lead to the establishment of the first factory in Denmark for the manufacture of spun rayon yarn for the domestic textile industry. The city of Silkeborg in Jutland is likely to be preferred as the site for the plant because it is located at the River Gudenaaen, known for its exceptionally soft water.

A/S Velund, Gresundsvej 147, Copenhagen, is reported to be making plans for the construction of the factory and its equipment which, to the greatest possible extent, will be made from Danish materials. Its cost is estimated at 5 million kroner and the plant would employ 200 male and 300 female workers. Work will commence as soon as assurance has been obtained from the Danish Minister of Commerce that import and exchange certificates will be available to cover necessary imports of the cellulose raw materials. Sweden is considered the natural source of supply for this material until Denmark in time may become able to supply it from its beech forests. (Commercial Attache T. O. Klath, Copenhagen, E. & T. 116.)

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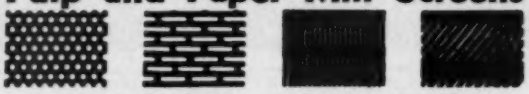

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July 1, 1936 to June 30, 1937
Cum. Scores as of May 31
8 Mills Have Perfect Record

PERFECT SCORE

Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B			
GROUP C			
GROUP D	Southern Extract Company	Knoxville	Tennessee
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Rogers Fibre Company, Inc.	Bar Mills	Maine
	The Mead Corporation	Nashville	Tennessee
	Central Fibre Products Co.	Vincennes	Indiana
	International Paper Company	Riley Mill	Riley, Maine

Division II

Container Corp. of America	Anderson	Indiana
Bemis Brother Bag Company	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-108	1	8	2.916
	P- 10	2	5	3.390
	P- 28	3	18	4.068
	P-121	4	7	4.264
	P- 27	5	16	5.752
	P- 30	6	11	5.885
	P- 25	7	7	6.109
	P- 19	8	9	6.224
	P- 18	9	18	8.149
	P- 58	10	11	8.364
	P- 23	11	12	8.463
	P- 11	12	11	9.035
	P- 84	13	17	9.064
	P- 13	14	16	9.381
	P- 12	15	14	9.636
	P- 21	16	12	10.568
	P- 22	17	12	10.667
	P- 44	18	20	11.121
	P- 69	19	19	11.216
	P- 9	20	34	12.246
	P- 1	21	38	12.541
	P- 2	22	18	12.829
	P- 64	23	25	13.043
	P- 62	24	27	13.392
	P-107	25	17	14.552
	P- 67	26	40	15.074
	P- 73	27	47	19.547
	P-101	28	32	21.403
	P- 87	29	42	22.825
	P-102	30	49	26.838
	P- 95	31	36	27.049
	P-127	32	39	27.770
	P- 40	33	39	30.487
	P-126	34	107	32.963
	P- 32	35	61	48.443
	P- 71	36	65	48.918
GROUP B	P- 60	1	1	1.051
	P-119	2	1	1.378
	P- 97	3	1	1.483
	P- 15	4	2	2.428
	P- 55	5	2	2.986
	P- 68	6	5	4.957
	P- 51	7	4	5.004
	P- 59	8	6	7.686
	P- 26	9	8	7.856
	P- 72	10	7	8.006
	P- 3	11	7	8.046
	P-112	12	9	9.188
	P- 70	13	10	10.280
	P- 4	14	8	10.541
	P- 16	15	21	24.426
	P-104	16	21	26.515
	P-128	17	29	29.309
	P-122	18	27	29.583
	P- 82	19	32	35.052
	P-124	20	30	35.389
	P- 45	21	47	42.978
	P- 46	22	40	46.871
	P-123	23	57	61.621

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP C	P- 52	1	2	3.994
	P- 89	2	4	7.465
	P- 14	3	4	9.394
	P- 88	4	6	9.949
	P-116	5	4	11.970
	P- 61	6	7	13.218
	P-103	7	6	14.334
	P- 37	8	9	14.764
	P- 56	9	8	15.970
	P- 43	10	7	16.021
	P- 41	11	9	17.923
	P- 39	12	15	23.013
	P- 94	13	11	27.947
	P- 29	14	18	29.530
	P- 50	15	12	30.903
	P- 91	16	11	33.092
	P- 49	17	12	34.967
	P- 34	18	17	36.746
	P- 17	19	20	46.308
	P- 80	20	16	46.341
	P-113	21	27	49.389
	P- 33	22	26	52.341
	P- 47	23	26	53.091
	P-111	24	29	55.607
	P- 48	25	39	66.830
GROUP D	P- 90	7	1	4.581
	P- 93	8	1	5.270
	P- 38	9	1	8.409
	P-110	10	1	9.129
	P-117	11	3	11.307
	P-109	12	2	11.566
	P- 98	13	3	12.871
	P- 85	14	1	13.713
	P- 5	15	5	16.132
	P- 36	16	5	19.575
	P- 86	17	4	23.734
	P- 6	18	8	25.328
	P-106	19	7	25.787
	P- 42	20	6	29.918
	P-125	21	5	31.515
	P- 53	22	7	37.744
	P- 99	23	7	38.193
	P-118	24	9	41.820
	P- 81	25	11	43.900
	P- 65	26	8	46.034
	P-129	27	33	109.680

Division II

R- 6	3	4	3.424
R-10	4	2	3.837
R- 2	5	3	3.870
R-20	6	5	4.325
R-19	7	2	4.726
R-15	8	1	6.538
R-18	9	4	11.977
R- 3	10	3	12.006
R- 1	11	6	12.217
R-21	12	12	14.043
R-13	13	4	15.541
R- 5	14	17	18.031
R-11	15	4	18.563
R-14	16	3	30.959

No May Report—Ten months total only: R-6
No April or May Reports — Nine months total only. Reports delayed: P-53

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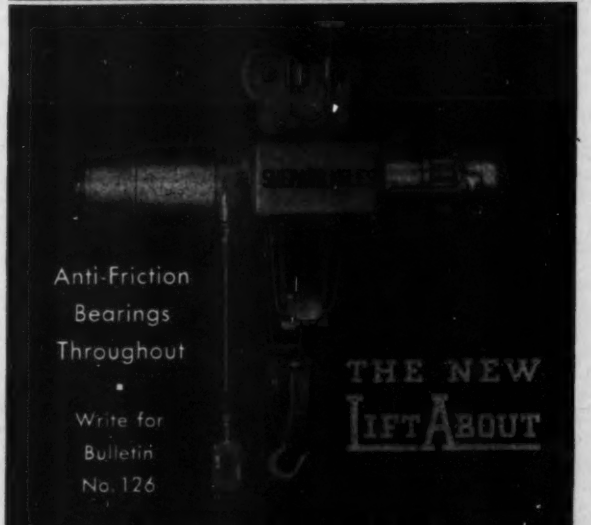

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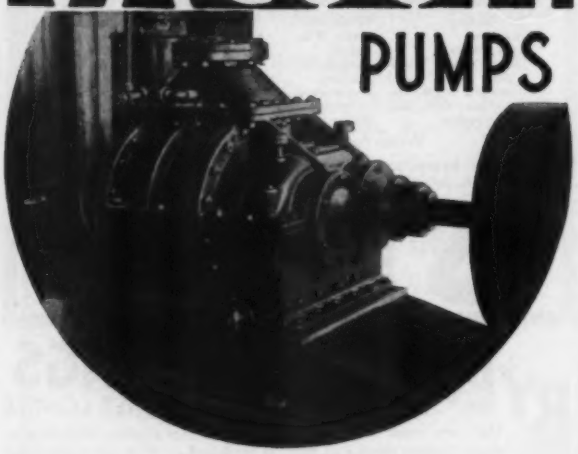

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POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Improving the Small Plant

Investigation will show that somewhere between 50 and 70 per cent of the smaller power plants in this country are being operated in an alarmingly wasteful manner. In most of these instances the average boiler efficiency will not exceed 55 per cent, and in many cases are far below even that figure.

While it is not possible in these plants, which range anywhere between 50 and 1000 boiler horsepower, to obtain central station efficiencies, it should be possible to approach 60 or 65 per cent without any great additional outlay for new equipment. In many cases the installed equipment is entirely adequate, and the poor economy is merely the result of lack of proper operating knowledge.

By the intelligent use of a few simple instruments, such as draft gauge and a CO_2 indicator, not a recording meter, but something that will enable the operator to determine from time to time what is going on inside the furnace, such plants can be placed on an efficient operating basis.

Here then is a fruitful field for the engineer who wishes to reduce his fuel bill and who is conscientiously concerned in conserving the nation's fuel resources. An average increase of say ten per cent (and this is entirely possible) in the efficiency of these smaller plants would save far more coal than will the one-half of one per cent the central stations and the high-grade industrial plants are striving so hard for.

◆ Diesel Engines Require Intelligent Care

It has been unfortunate, perhaps, that in the early days of Diesel engine development the engines were sometimes sold and installed with the viewpoint that their operation required no particularly skilled intelligence. As a matter of fact, this was not the case, nor is it the case of any type of prime mover which may be placed in the power plant. For the operation of such equipment, brains are required.

As a result of this early and possibly mistaken sales policy, Diesel engines in some cases fell down on the job. The method of operation was not correct from an engineering standpoint. Engines were overloaded and overheated, run without sufficient lubricating oil and all manner of serious errors were made in connection with the method of handling such equipment.

Since that time, most manufacturers of this type of equipment have realized that the operator must have a definite training and be just as intelligent as operators of other types of prime movers. This policy, together with the many improvements which have been made in Diesel engines during the past few years, has practically erased the prejudices which were then formed. The Diesel engine today is back where it belongs as a type of prime mover which will give excellent service if properly applied, installed and operated.

◆ ONE POUND OF STEAM used first in a steam engine or a turbine and then in a heating system will replace approximately 1½ lb. of steam required where the engine or turbine is run condensing and live steam is used in the heating system.

◆ IF THE WEARING SURFACE of a concrete floor crumbles or dusts under moderate traffic, the wearing qualities of the floor can often be improved by the application of some hardener or treatment. Magnesium fluosilicate, sodium silicate, aluminum sulphate, zinc sulphate and various gums, soaps and paraffins are among the best known substances used to treat concrete floors. The market affords a number of compounds which are widely recommended for inclusion in the body of the concrete. Instruments for the use of these compounds invariably call for many of the methods and practices which are known to be essential for successful concrete floors built without the inclusion of integral compounds.

◆ Precautions in Using Soot Blowers

Disturbance of soot and ash that often accompanies soot blowing can be lessened considerably if not eliminated entirely by always opening the stack or breeching and ash-pit dampers wide before blowing, regardless of the rate of combustion. The soot and flue-gas dust liberated by the steam will then be carried up the stack by their own impetus, to be carried on their way by the draft. The high velocity of the upgoing gases will also minimize the amount of flue-gas dust and soot redepositing upon the boiler surfaces.

Where soot blower elements blow in a direction opposite to the flow of gases up the stack, puffing and smoking of fires may persist. Keeping stack and ash-pit dampers wide open minimizes this, however, and lessens the amount of dust that may resettle upon the surfaces within the boiler passes.

It ought hardly to be necessary to point out that the lowest element, which is that nearest the fire, should be operated first, each element in the direction of gas-flow being taken in consecutive order.

Improvements and refinements in mechanical soot blowers should not be allowed to bring about less care in using them. Rather, they should be used to encourage greater care in the effort to bring about longer life, lower maintenance costs and higher over-all economy.

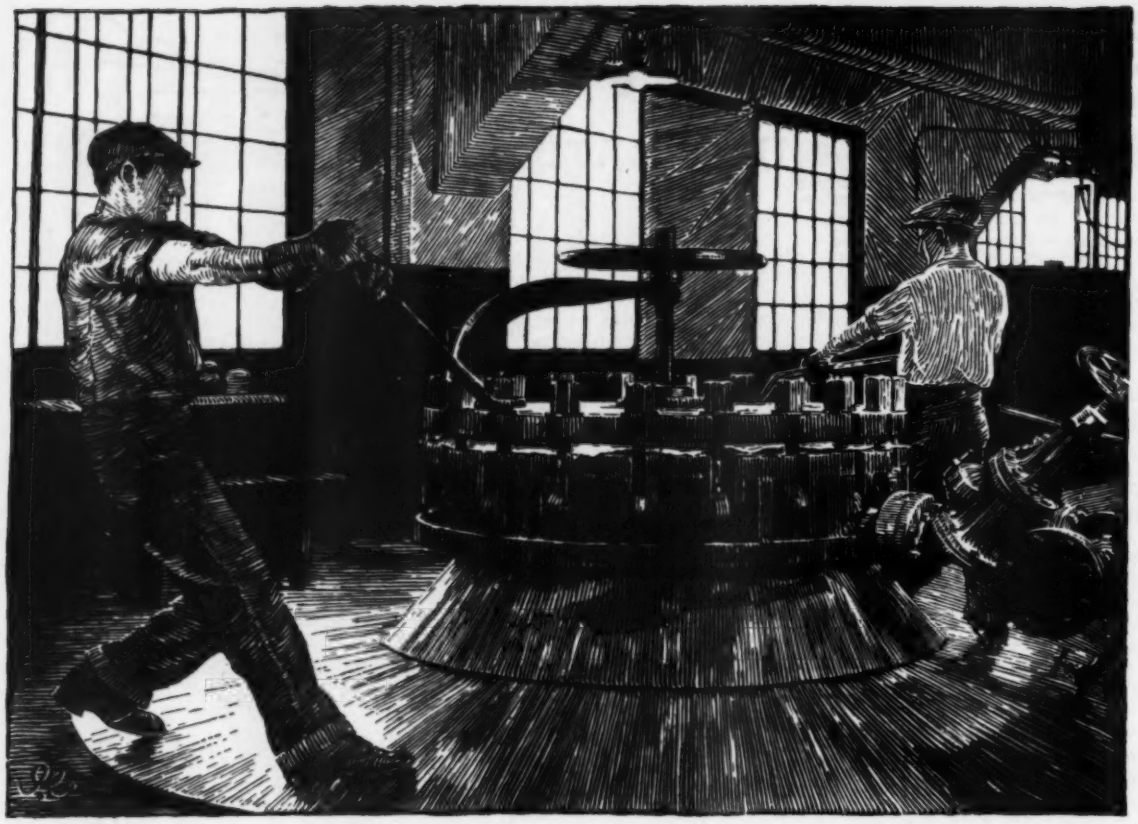
◆ Corrosion Due to Oil

Corrosion of boiler plates due to oil is limited to that class of oils and greases which break up under heat and pressure to form organic acids; obviously, this condition occurs with highly compounded or vegetable oils.

In the presence of treating sodas, however, the corrosive qualities are neutralized before pitting takes place, but in this connection it is well to remember that where waters are treated with compounds and no definite control over the soda concentration is exercised, the corrosion may proceed at times when an excess of soda is not present. In cases of waters high in permanent hardness much of the soda introduced is destroyed by the scale-forming salts as, for instance, calcium sulphate. It is obvious, therefore, that when such corrosion takes place, in the presence of treating agents, there has not been sufficient excess of soda or alkalinity, as it is called in chemical terms.

◆ AIR FLOW THROUGH THE boiler furnace should be in direct ratio to the fuel supply and this ratio should only be varied when the grade of fuel is varied, that is to say, a poor grade of fuel may require more air than a good grade of fuel. The ratio of fuel to air once being established, it is desirable to maintain the ratio for the entire range of control or for the entire range of load fluctuations.

◆ HOLES AND THIN PLACES in the fire are often overlooked in the corners at the front of the furnace and in front of the brickwork between the firing doors. In stoker practice it is well to watch for large air leaks through the coal hopper.



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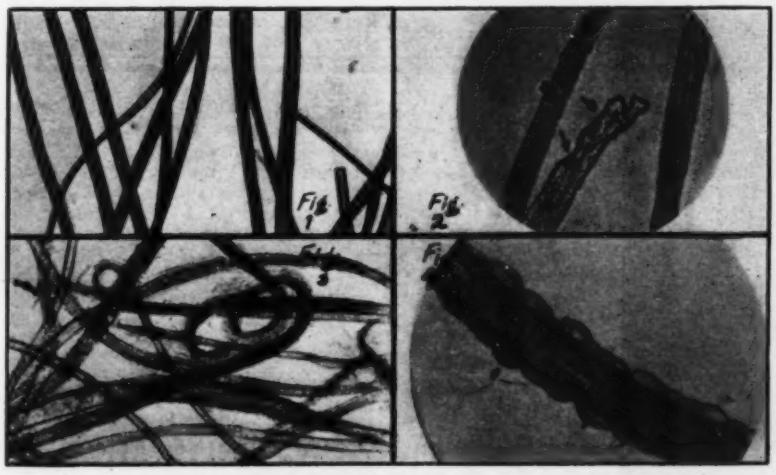
TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

IN THE PAPER INDUSTRY

◆ Injury to Paper Felts

This abstract covers two articles. In the first, Dr. Mendrzyk, dealing solely with woolen felts, and basing his data on the work of others, concludes that sound wool must be present in all felts, i.e. wool unattacked by chemicals moths or bacteria to obtain satisfactory results in practice. Sound woolen fibers are shown in Figure 1, taken from a carefully inspected felt. The chief chemical difficulty seems to be due to retention of alkali in the wool. This is often responsible for shortened life and for tearing of the felt and is not removed in the fulling mill. New felts may have a PH of 9.0 or more in the inner portions of the fiber. Although the felt becomes acid during the course of papermaking operations, this does not remedy the attack of the alkali originally present. Moth attack in the wool is shown in the photomicrograph in Figure 2. Another type of attack that is less frequent is due to the action of direct sunlight. When fabric attacked in this way is treated with 0.1 normal alkali, the sides affected by the light become swollen as shown in Figure 3 (center of illustration), while the rest of the fibers remains practically unattacked. To this author, the alkali action appears to be the most severe and destructive of the various agencies. It is especially noticeable in dry felts that undergo a relatively high temperature. Even wet felts however, from which the initially present alkali is washed out, may retain resinsize. For this reason they are often subjected to special washes containing soda, which has a milder injurious effect on the wool.



The so-called Allwörden reaction indicates slight damage by alkali. When an undamaged wool fiber is treated with dilute chlorine water, swelling is noted between the scales, with the formation of little blisters, filled with a clear fluid. This is shown in Figure 4. Whenever the fiber is injured by alkali attack, these blisters fail to appear. So the test is for sound woolen fibers only. The degree of injury may be gauged by noting the number of non-swollen fibers, among a given number of fibers. Stronger alkali attack is indicated by Becke's tin salt reaction (—unfortunately no references to the original literature are given). With this a new, sound felt remains light colored, while felt containing alkali or damaged by alkali causes a brown coloration, that may be very marked. According to Dr. Mendrzyk felts are much more susceptible to alkali than to acid treatment since a ppH of 2-3 must be reached before much damage is evident in the acid range. However, weakening may occur, and can be noted microscopically through the swelling reaction, following treatment with ammoniacal KOH. This is known as the Krais-Markert-Viertel test. Here the appearance of blisters within 1.5 to 3 minutes indicates degradation due to acid. The time interval is very important. If the blisters form only after 8-10 minutes, the wool has not been attacked by acid. The appearance of these blisters is very different from that of those formed in the Allwörden alkali test referred to above. They have an inner granular structure. The Krais test has its limitations. If the dry felt has been heated with acid, it fails. However, the pH determination is useful in checking up possible acid attack. Wet felts may also be attacked by bacteria, which cause a typical fiber-splitting in the wool. Methods for detecting bacterial attack are discussed briefly. Often Bacillus subtilis does the damage.

The second article by Ruth Werner is based on her own experimental data. Efforts to cut down degradation of woolen felts by the use of formaldehyde gave negative results. Dr. Werner focuses her attention on the attack due to sulphuric acid. Ubbelohde claimed that by treating the felt with a mixture of air and ammonia, this type of disintegration is inhibited and that the life of the felt is prolonged 50 per cent. However, practical experiments have not borne this out, and Dr. Werner has studied the problem. Ammonium sulphate formed by neutralization of free suphuric acid, and which other investigators claim is completely removed from the felt by washing, does seem to diffuse back into the paper web, and is thus no longer injurious to the felt. However, a different condition exists in the case of the sulphuric acid which is gradually generated from sulphur compounds present in the felt, due to conditions in the papermaking operations (i.e. air-oxidation, high temperatures and humidity). This acid appears to be held tenaciously combined with the fiber, and resists washing. In the presence of ammonia and air, the oxidation of sulphur compounds to sulphuric acid seems enhanced, and antioxidants (phenol, quinones phloroglucinol, etc.) were not only ineffectual but in part, actually furthered degradation. Dr. Werner thus concluded that wool felts are intrinsically unsuited to the papermachine, and that cotton felts are much less sensitive to chemical influences. For example, ammonia-air mixtures remove sulphuric acid completely from cotton (the acid presumably emanating from the paper web) and cotton felts are not readily oxidized, even at 105 deg. C. with steam and water. Furthermore, cotton felts retained their extensibility longer than did those made from wool. The latter were less readily attacked by steam alone than by steam-air mixtures, at least when it came to the sulphur compounds in the felt. Unfortunately other components of the wool are degraded by steam alone, so the life of the felt is lessened. Even when components in the stock which are believed to be injurious to felts are removed, wool remains unsuitable for dry felts. The original article contains comparable data on the tear resistance and stretch of old and new samples of both wool and cotton. H. Mendrzyk. Papier-Fabr. 35 (Tech. Teil) 125-8 (1937). Ruth Werner. Papier-Fabr. 35, Abstracts, 37 (1937) (summarizing Dr. Werner's dissertation —1936.)

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◆ Drying Felt Breakdown; Causes and Remedies

Causes of breakdown of wool felts are principally the action of resins, of sulphuric acid from alum hydrolysis, of the high working temperatures, and mechanical stresses. Additions, such as formaldehyde, have no good effect. Use of an ammonia-air mixture for neutralizing free sulphuric acid is recommended, but this is not completely successful since it does not neutralize the acid formed by oxidation of the combined sulphur in the wool. Impregnation with anti-oxidants does not stop this reaction, and is harmful in other ways. The replacements of wool felts by cotton is recommended to overcome these difficulties. Cotton can be completely neutralized by an ammonia-air mixture, it is only slightly oxidized by air and steam of 105 deg. C., and it retains stretch longer than wool. Oxidation of wool can be avoided by excluding air, but steam alone will break down wool keratin, and wool is thus generally poorly suited for drying-felts. Werner, (Dissertation, 1936) "Beiheft 23 zu den Zeitschriften des Vereins deutscher Chemiker." Through Papierfabr. 35, abstracts 37 (1937).

◆ Stability of Paper Under Influence of Light

The relative stability of paper when exposed on either side to the direct action of sunlight for 25 hours (i.e., a total of 50 hours) showed marked effects. The physical properties tested in exposed and unexposed book papers showed a decrease in the tearing length, stretch and folding endurance, with less change, however, in the bursting strength. The tearing length and folding endurance are especially lowered in the machine direction of the sheet. The stretch changes more markedly in the cross direction. Decrease in the alpha cellulose content was quite marked after 100 hours of exposure. In all instances the copper numbers increased greatly after exposure; in one instance from 3.99 to 8.15. The acidity also increased, in one case from 0.065 to 0.463 per cent SO_3 after 100 hours of exposure. The degree of whiteness and sizing are also affected. M. Kometani. Cellulose Ind. (Japan) 12,35-7 (1936). Through Papier-Fabr. 35 (Abstracts) 10-11 (1937).

◆ Froth Prevention and Removal

Froth in papermaking is often due to substances affecting the surface of the liquids or suspensions. The breaking of froth has hitherto been accomplished by the addition of ether (which is undesirable due to its high inflammability) and oils (which may cause spots on the paper). The present claim is that froth may be prevented completely by adding small quantities of vegetable phosphatides. For example, when froth forms during the washing of old rags or in the working up of old, waste paper, it can be removed immediately by the addition of 30 grams of a 10 per cent hydrosol

Tanks for Champion

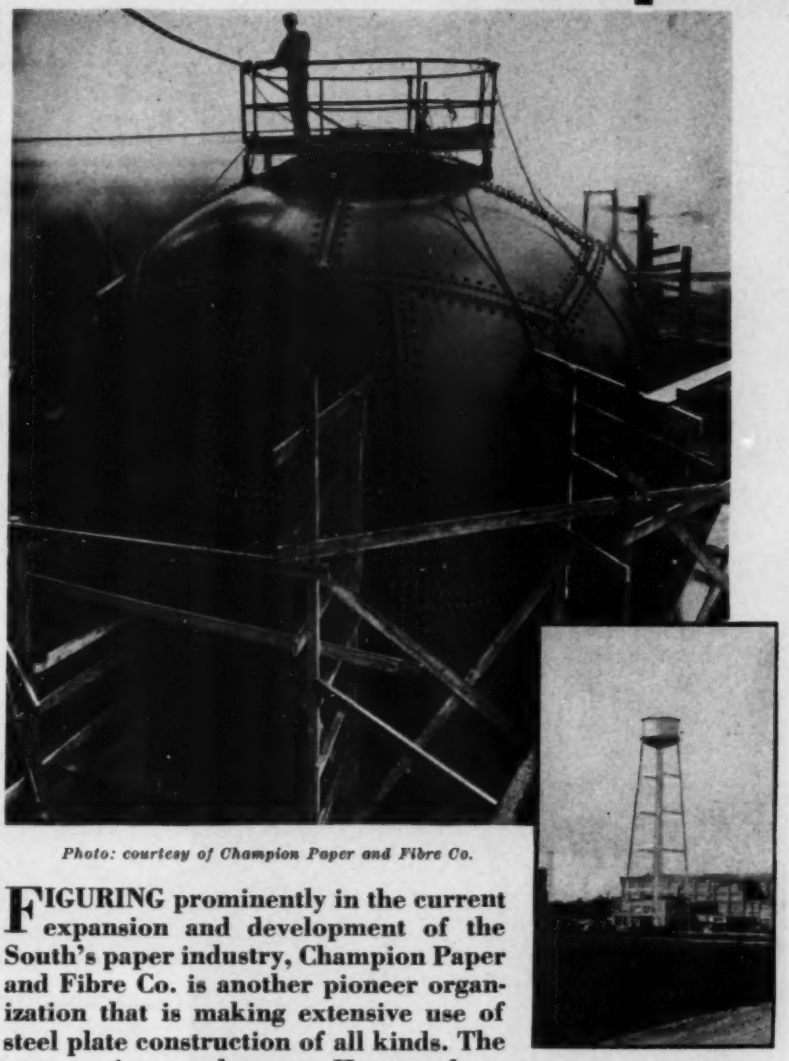

Photo: courtesy of Champion Paper and Fibre Co.

FIGURING prominently in the current expansion and development of the South's paper industry, Champion Paper and Fibre Co. is another pioneer organization that is making extensive use of steel plate construction of all kinds. The upper picture shows a Hortonsphere which is used as the acid accumulator for a *Chemipulp cooking and recovery system* which has recently been placed in operation in Champion's Canton, N. C., mill. The lower picture shows a 100,000 gal. Horton elevated tank which provides water for the fire sprinkler system in Champion's new Pasadena plant near Houston, Texas.

These are just two examples of the wide variety of steel platework being regularly supplied by our shops. For quotations or information, address nearest office.

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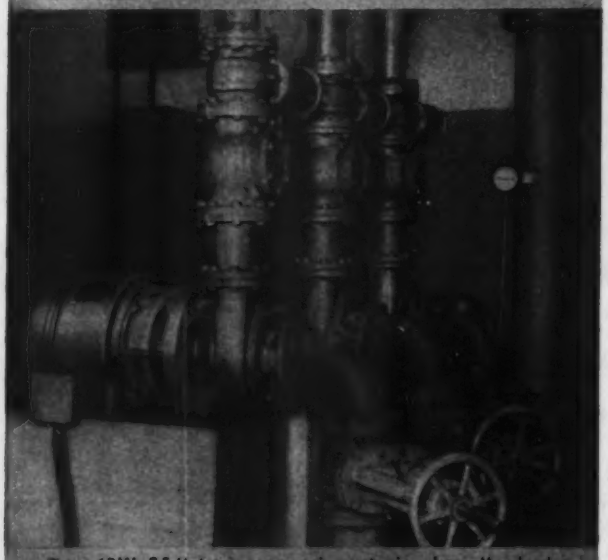
A No. 3 RV-10 MOTORPUMP installed in a Maine paper mill. This pump handles 500 gallons per minute of white water against 55-ft. head.



Three 4RVL-25 Motorpumps pumping water in a large Maryland paper mill. Each of these units is rated at 700 gpm. against a total head of 100 feet.

The Cameron

MOTORPUMP

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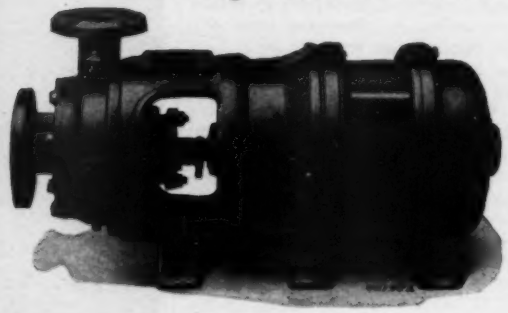

SINCE its addition five years ago to the already well-established line of Cameron pumps, the MOTORPUMP has become increasingly popular with the pulp and paper industry throughout the country.

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of vegetable phosphatides. (These substances are mixtures of compounds related to the fats. Chemically they may be looked upon as fats in which an acyl group has been replaced by a complex derivative of phosphoric acid. For example lecithin, which is a common phosphatide isolated from egg yolk, when hydrolyzed yields glycerol, a mixture of fatty acids, phosphoric acid and the organic base choline—Abstractor.) Lehmann and Voss Co., Hamburg. German Patent No. 635,881, KC 55b.

◆ Viscosity of Cuprammonium Pulp Solution

Figure 1 shows a specially constructed glass vessel (A) whose volume is approximately 40 cc., and in which a definite amount of pulp may be rapidly dissolved in cuprammonium solution, the preparation of which is described in minute detail. The ground in glass top is held to the body of the vessel (A) through projecting ledges (termed Zapfen) that are connected by spiral springs (termed Spiralfeder). The latter are not shown in the illustration. The main advantage is that, due to stopcock and pycnometer head, air and light may be excluded, thus rendering inert gases unnecessary, and that after rotating slowly (30 r.p.m.) in a special casing shown in Figure 2, or, suitably covered, on a rotating wheel, shown in Figure 3, the sample dissolves in 5-15 minutes. Usually 0.386 g. pulp (rasped or in leaflet form) are introduced into (A), which contains a number of small stainless steel balls, together with 38.6 cc. of cuprammonium solution. After a homogeneous sol has

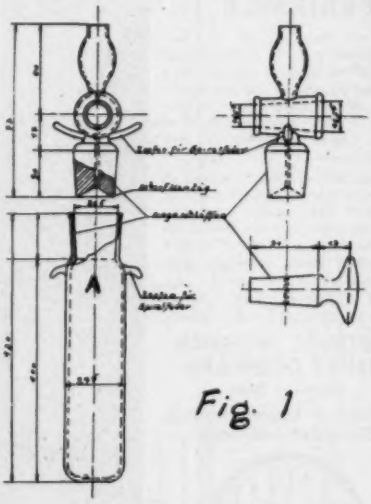


Fig. 1

been obtained, the relative viscosity is measured in an Ostwald viscosimeter at 20 deg. using thermostatic control, and keeping the viscosimeter in water containing a red dye to avoid photochemical action.

The entire determination requires 30-35 minutes, and in practiced hands gives sharply reproducible results, which are practically identical with those obtained when nitrogen is used to exclude air. When pulps yielding highly viscous solutions are at hand, the cellulose concentration may be varied from 0.25 per cent to 0.75 per cent (instead of the usual 1 per cent sol prepared in (A)). Brown glass is no longer essential in protecting against light. Results are usually accurate to (plus or minus) 2 per cent. For details the original article should be consulted. Besides the technique outlined above, a modification of Höppler's falling ball viscosimeter, which also serves as dissolving vessel, has been devised. The advantage here is that the

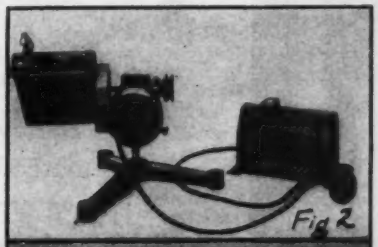


Fig 2

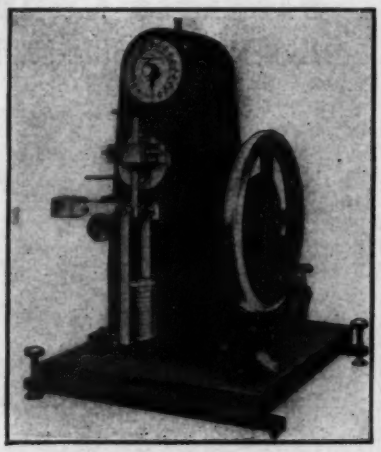
Fig 3

cuprammonium sol need not be transferred to another vessel, and that repeated determinations may be made on the same sample of solution. The necessary mathematical calculations are given for converting relative into absolute viscosities. Relative viscosities range as follows (for 1 per cent cuprammonium solutions):—bleached pulps (13-28); rayon pulps (18-25); bleached linters (40-100); high viscosity pulps (30-120); unbleached pulps (40-250). F. Schütz, W. Klauditz, and P. Winterfeld. Papierfabr. 35, (Tech. Teil) 117-21 (1937).

◆ Bending Endurance Tester

The original Schopper folding endurance tester was designed, not for extreme samples like board or tissues, but for ordinary papers. Later special instruments were developed for testing films, presspan, roofings and even metallic foils. Each type of material required its own modification of the tester. Wishing to find an instrument universally applicable, Schopper has now built the bending endurance tester, shown in the illustration. The two articles referred to in this abstract take up a detailed description of the instrument, its application, the mathematical treatment of the data, and a comparison of these data with the folding endurance numbers of papers ranging from fine tissues to press pan. In the new bending tester, the vertically placed 15 mm. strip suitably clamped (with or without the application of tension) is bent too and fro through a definite angle that may range from 5 to 90 deg. (usually the latter) until the point of failure is reached. The instrument permits 110 bends per minute. The so-called ideal bending number is that obtained under zero tension. The bending tear length is also defined. In the case of papers the deviations from the average for 50 determinations is about the same for the new instrument as for the folding endurance tester, but no simple correlation between data obtained with the two instruments has been found.

The ratio of folding-to bending numbers varies enormously in different papers. In certain writing papers it is unity, while with tissues it is quite high. Folding and bending numbers vary with the tension. Usually logarithmic curves of the bending numbers plotted against the tension (for both cross and machine directions of the paper and for various basis weights may be linearly extrapolated to the common value of the ideal bending number for zero tension. This, in many cases may be considered a constant for a definite stock. In his paper, Schopper includes the composition of the sheet from which the test strip is taken, the tearing length at the point of failure, the so-called partial tearing length. *(Teilreislänge)*, the weights (tension) applied to the strip during the test, and



the various bending endurance numbers. Data have been collected in a series of illustrations and graphs. Whether or not the instrument can be used universally is a question that further research will determine. However, its present usefulness to the papermaker has been demonstrated adequately. Alfred Schopper. Wochbl. Papierfabr. 68, Tech Tl., 97-100; 119-24 (1937); Korn. Papierfabr. 35 (Tech Teil) 33-7 (1937).

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◆ Conductivity Measurements on Paper Extracts

The conductivity of the aqueous extracts from condenser papers is correlated with their electrical properties. The method of Jander and Schornstein (Cf: Chemical Abstracts, 23,476 (1933)) was found very satisfactory and this method is thoroughly discussed and illustrated.

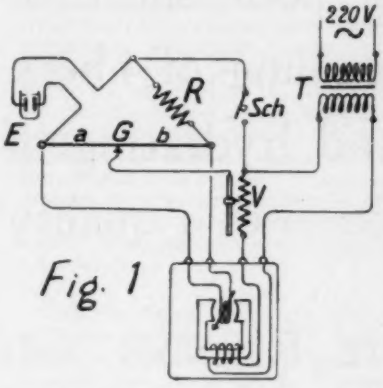

Fig. 1

The layout is shown in Figure 1, where (E) is the electrode vessel, (R) a known resistance, (G) a sliding contact which divides the measuring wire into parts (a) and (b), (T) is a transformer, (Sch) a switch so connected that it breaks the current when closed, (V) the rheostatic resistance which serves to excite the electromagnet that is a part of

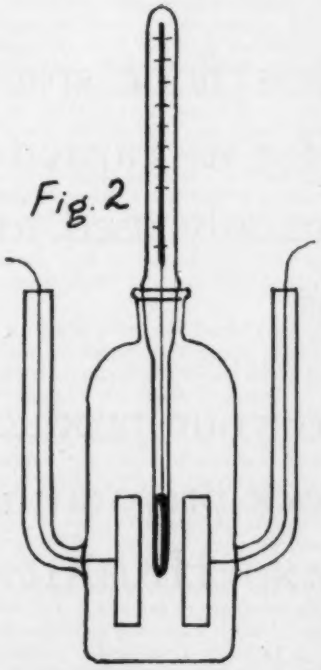
Fig. 2

the instrument used in measuring the alternating current and which replaces the permanent magnet that would be used in instruments measuring direct currents, (i.e., in moving coil galvanometers). The entire system is used in place of the older telephonic method for measuring conductivity. Figure 2 shows (E) in which thermometric control is required. A thermostat water bath arrangement may be used for such control. In general, 3 grams of the paper sample to be examined are macerated with 150 cc of boiling water, and then kept for 1 hour in a water bath. The extract is then separated from the paper, cooled to a definite desired temperature and examined by the method outlined. A Lampertz and Bruno Schulze. Wochbl. Papierfabr. 68, (Tech Teil) 139-42. (See also, THE PAPER INDUSTRY, June 1937, 335).

◆ New Cellulose Determination in Wood

Basing their method on Wedekind and Engel's German patent No. 581,806, the authors have succeeded in obtaining a method the results of which are comparable with those obtained by the Kürschner procedure. (For the latter cf. Papier-Fabr. 25,390 (1929)). The sawdusts of Scots pine, fir, birch and alder were extracted successively with water and alcohol-benzol (1:1) in a Soxhlet for 6 hours. One gram of the bone-dry sample is then heated with 15 cc. of dioxan and 2 to 3 drops of 0.04 per cent HCl, during 6 hours at 90-95 deg. C. under reflux. (Without the HCl the dioxan is practically inactive.) The residue is filtered by suction, washed with dioxan, and with water, and then dried to constant weight. In the samples studied, the cellulose yields varied from 55.5 per cent to 56.1 per cent (while parallel determinations on the same samples by Kürschner's technique gave 55.13 to 55.21 per cent. The cellulose isolated by dioxan seems to show more satisfactory properties (copper number, residual lignin, and residual pentosan) than cellulose obtained by other methods. In the original dioxan filtrate from the cellulose, the authors also determined lignin and reducing sugars. The Scots pine contained 14.09 per cent; the birch 13.5 per cent; fir 12.9 per cent and the alder 16.6 per cent lignin (in this filtrate). The respective yields of the reducing sugars were 15.8 per cent; 14.73 per cent; 11.9 per cent and 13.5 per cent for these same woods. H. S. Koslow, L. E. Oliphson, and S. M. Goldina. Bumazhnaya Prom. (THE PAPER IDUSTRY, U.S.S.R.), 10, 16-20 (1936) through Papierfabr. 36 (Abstracts) 46 (1937).

◆ Sulphur Compounds Used in the Paper Industry

This is a thorough monograph covering in some detail descriptions of the manufacture, composition and methods of analysis of sulphur dioxide (made from pyrites, $CuFeS_2$ and ZnS), H_2SO_3, Na_2SO_3, calcium bisulphite, sulphuric acid, sodium and zinc hydrosulphites, hypo, sodium sulphide, sodium bisulphate, alum, and papermaker's alum. Sizing is also discussed at some length. G. M. Papeterie, 58, pp 914, 917-8, 962, 965-6, 1010, 1013-4, 1058, 1061-2, 1110, 1113-1114, 1117 (1936); 59, pp 1-2, 5-6, 9, 66-9 (1937).

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PAPERMAKING PATENTS

IN THE UNITED STATES

Inquiries with reference to any of these patents should be addressed to James Atkins, Munsey Building, Washington, D. C.

Compiled by James Atkins, Registered Patent Attorney

2,072,086—Digesting Method and Apparatus. Joaquin Julio de la Roza, Sr., Great Neck, N. Y., assignor to de la Roza Corporation, Wilmington, Del., a corporation of Delaware. Application December 3, 1934, Serial No. 755,687. 10 Claims. (Cl. 92—7.) In a digesting apparatus having a digesting chamber, an inlet passage to said chamber, means for forcing material to be digested through said passage; a valve in said passage and means in said passage responsive to the density of the material in said passage for controlling said valve.

2,073,764—Safety Paper and Method of Making the Same. Burgess W. Smith, Rochester, N. Y., assignor to The Todd Company, Inc., Rochester, N, Y., a corporation of New York. No Drawing. Application August 22, 1932, Serial No. 629,890. 2 Claims. (Cl. 91—67.95.) A method of making safety paper comprising the step of adding p,p'-diaminostilbene during or after the formation of the web for the purpose of producing, by its reaction, a visible indication of the use of an ink eradicator.

2,075,333—Treatment of Paper. James Augustus Arvin, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware. No Drawing. Application March 3, 1934, Serial No. 713,945. 5 Claims. (Cl. 91—68.) As a new article of manufacture paper treated with the resinous reaction product of a substantially unpolymerizable polyhydric phenol and an organic polyhalide whose halogen atoms are all attached to different carbon atoms, said carbon atoms being joined to other atoms by single bonds only.

2,075,835—Coated Paper or Sheet. Allen L. Spafford, Cloquet, Minn., assignor, by direct and mesne assignments, of one-half to Wood Conversion Company, Cloquet, Minn., a corporation of Delaware, and one-half to The Paper Service Company, Cincinnati, Ohio, a corporation of Ohio. Application August 17, 1931, Serial No. 557,564. 8 Claims. (Cl. 154—28.) The method of making a water-proof insulation material consisting of a fibrous elastic core and a covering sheet which comprises coating one side of a flexible sheet material with a waterproofing substance which produces a flexible coated sheet, applying a heat-responsive adhesive to the other surface of the sheet, passing the sheet over a roll with the adhesively coated side in contact with the roll to cause it to adhere thereto, stripping the sheet from said roll whereby the paper is creped, and then uniting the creped sheet to a fibrous elastic core by means of the adhesive previously applied thereto for creping, the waterproof coating material being non-tacky or non-adhesive under the conditions of uniting the adhesive side of the sheet to the insulating core.

2,075,836—Manufacture of Coated Sheet. Allen L. Spafford, Cloquet, Minn., assignor, by mesne assignments, to The Paper Service Company, Cincinnati, Ohio, a corporation of Ohio. Original application August 17, 1931, Serial No. 557,564. Divided and this application April 5, 1933, Serial No. 664,506. 12 Claims. (Cl. 154—33.) The method of making creped sheets which comprises coating one side of flexible sheet material with a heat-resistant coating which is flexible with the sheet and non-adhesive at the below-mentioned creping heat, coating the other side of the sheet with a heat-plastic adhesive, passing the sheet over a heated roll with the adhesive side in contact with the roll to cause it to adhere thereto, and stripping the sheet from the roll whereby the sheet is creped.

2,076,415—Apparatus for the Drying of Paper or Fabrics. Frank W. Partsch, Jackson Heights, N. Y., assignor to J. O. Ross Engineering Corporation, New York, N. Y., a corporation of New York. Application April 19, 1935, Serial No. 17,161. 5 Claims. (Cl. 34—48.) A drier for a web material comprising a chamber, a set of parallel rollers adjacent the top of said chamber, a second set of parallel rollers adjacent the bottom of said chamber, said rollers being arranged to support a web in a series of loops, a set of nozzles substantially parallel to and arranged above said first set of rollers, a second set of nozzles substantially parallel to and arranged below said second set of rollers, each nozzle being provided with a longitudinal row of discharge ports for supplying air to said web and each nozzle being rotatable about its longitudinal axis to vary the angle of impingement of the air upon said web and means for supplying heated air to said nozzles.

2,076,899—Disintegrating Paper Making Material. Marcel Lamort, Vitry-le-Francois, France, assignor to E. et M. Lamort Fils, Vitry-le Francois, France. Application March 9, 1934, Serial No. 714,883. In France March 17, 1933. 4 Claims. (Cl. 92—20.) An apparatus for transforming into fluid paper pulp semi-raw materials such as sheets of cellulose, comprising a tank, means for removing the pulp from the tank when the latter is full of liquid, a perforated chamber in the tank, the lower part of which chamber is sloped, a gate normally closing an opening disposed in said chamber at the bottom of the slope, means maintaining said gate in closed position against the pressure of the liquid, but yielding to the outward pressure of foreign bodies in the chamber having a density greater than that of the pulp, and at least two rotatable stirrers in said chamber carrying arms, which stirrers turn about substantially parallel axes spaced apart from each other.

2,076,991—Method of Attaining Improved Felting of the Fibers in Paper Pulp on the Wet Part of Paper and Board Making Machines. Sigbjörn Paul Herbert Ebbinghaus Holgersson, Storvik, and William Anders Eugen Tibell, Molndal, Sweden. Application April 4, 1935, Serial No. 14,718. In Sweden April 7, 1934. 2 Claims. (Cl. 92—45.) Improvements in paper or board making machines for effecting an improved felting of the fibers in the pulp, comprising in combination an endless wire cloth, breast rolls and table rolls for supporting the same, means for imparting longitudinal motion to said wire cloth, a stuff box, an apron between the stuff box and the wire cloth, the said rolls being provided with a fixed core and a rotatable shell, and alternating-current vibrators connected with said shell and adapted to impart to the same high frequency vibrations, at least 1000 per minute.

2,076,993—Decorative Sheet and Process of Preparing the Same. James J. Jackson, Woodbury, N. J., assignor to Paulsboro Manufacturing Company, Paulsboro, N. J., a corporation of New Jersey. Application February 10, 1934, Serial No. 710,739. 12 Claims. (Cl. 91—68.) The process of preparing a decorative sheet which comprises applying decorations substantially throughout the thickness of a fibrous felted paper sheet, roughening one surface of said sheet to form ridges thereon by subjecting the surface to a scraping treatment whereby fibers are pulled up into ridges, this sequence being recurrent as applied to successive parts of the sheet surface and the result being a series of ridges, impregnating the resultant sheet with a toughening saturant, and treating said roughened surface to raise a nap thereon.

2,077,015—Paper Making Process. Elmer C. Schacht, Troy, N. Y., assignor to Behr-Manning Corporation, Troy, N. Y., a corporation of Massachusetts. Application October 27, 1932, Serial No. 639,905. 7 Claims. (Cl. 92—21.) Artificial leather comprising a paper-like web of comminuted separator and fibres permeated with a binder, and a smooth substantially flexible coating on one surface of the web.

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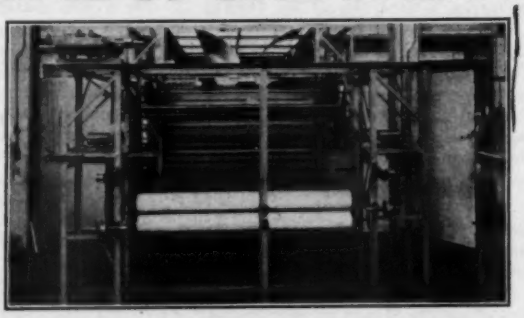

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2,077,016—Paper. Elmer C. Schacht, Troy, N. Y., assignor to Behr-Manning Corporation, Troy, N. Y., a corporation of Massachusetts. Application October 27, 1932, Serial No. 639,907. 8 Claims. (Cl. 92—21.) Sheet material comprising a laminated paper-like web having the laminae thereof felted together into a substantially integral structure, rubber-like binder material in the laminae of said web, one of said laminae having a greater percentage of binder than another thereof and the binders being of respectively different types whereby to provide laminae of different characteristics.

2,077,017—Paper. Elmer C. Schacht, Troy, N. Y., assignor to Behr-Manning Corporation, Troy, N. Y., a corporation of Massachusetts. Application October 27, 1932, Serial No. 639,906. 8 Claims. (Cl. 92—21.) Sheet material comprising a laminated paper-like web having the laminae thereof felted together into a substantially integral structure, resinous binder material in the laminae of said web, one of said laminae having a greater percentage of binder than another thereof and the binders being of respectively different types whereby to provide laminae of different characteristics.

2,077,059 — Reclaiming Fiber From Wastepaper. Francis H. Snyder and Stanley F. M. Maclaren, New York, N. Y., assignors to Snyder Maclaren Processes, Inc., New York, N. Y., a corporation of Delaware. Application May 23, 1934, Serial No. 727,120. 8 Claims. (Cl. 92—20). The process of reclaiming fiber from wastepaper which comprises subjecting an aqueous suspension of the wastepaper of from ten to sixty percent density to a mechanical mixing action in the presence of a deinking reagent, adding water to the resulting mass to provide a dilute suspension, removing extraneous solid matter from the mass, removing a portion of the liquid present to provide a suspension of from five to thirty-five per cent density, adding bleach to the mass, subjecting the resulting mass to a mechanical mixing action, and recovering and washing the resulting fiber.

2,077,112 — Imitation Leather Paper. Harvey G. Kittredge and Albert J. Turner, Dayton, Ohio, assignors to The Kay and Ess Chemical Corporation, Dayton, Ohio, a corporation of Delaware. Application December 28, 1934, Serial No. 759,550. 1 Claim. (Cl. 91—70.) In a method of making imitation leather which comprises applying to one side only of flexible cellulose material a composition containing rosin modified phenol-formaldehyde resin, raw Chinawood oil, cobalt linoleate, lead linoleate, a thinner and a coloring agent. and drying the coating at a temperature sufficiently high to form a wrinkled leather-like surface bonded to the flexible material by a partial penetration thereof, the temperature of drying not being carried to a point where the flexible cellulose material will be injured.

2,077,393—Paper Manufacture. Arthur Minard Brooks, Andover, Mass., assignor to Raffold Process Corporation, a corporation of Massachusetts. No drawing. Application September 26, 1934. Serial No. 745,649. 19 Claims. (Cl. 92—21.) Substantially white printing paper comprising fibrous material and at least five per cent by weight of substantially white substantially water-insoluble oxalate filler.

2,077,475—Method and Means for Making Paper. Carl S. Hamersley, New York, N. Y. Application October 22, 1934. Serial No. 749,351. 3 Claims. (Cl. 92—76.) In a paper-making machine, a set of dryer rolls, a stack of calender rolls, means for continuously feeding a freshly formed paper web to the dryer rolls and thence directly to the calender rolls, and means for continuously wetting the initial calender roll to a controllable limited degree, whereby the web is rewetted to a corresponding limited degree at the instant of commencement of the calendering treatment; said means comprising a device adjacent to said roll for producing an accurately controllable spray, and an applicator roll having a configured rubber surface and adapted to receive the water of said spray and transfer it by contact to said calender roll.

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The COMMERCIAL OUTLOOK

New York, July 1, 1937.

THE market for paper has slowed down to a perceptible degree. With the coming of summer and marked contraction in general business, insofar as concerns buying in the wholesale field, paper consumers, converters and jobbers have curtailed their operations as purchasers to a sufficient extent to make for a decidedly quiet market condition as contrasted to the active situation prevailing until recently. Opinion within the trade is that the quieting is a temporary or seasonal development, and a natural sequence to the very brisk buying of paper and board, but the fact remains the market has turned distinctly slower.

Mills with few exceptions have a good backlog of orders, in conjunction with a sizable volume of contracts for their product, and are running on a fairly active scale. However, new orders are coming in much slower, and it is commonly believed the next couple of months will witness comparatively limited demand unless something now unforeseen arises to stimulate purchasing. The probabilities are paper manufacturers will keep operating at a moderately lively pace during the summer, since they are well fixed with contracts and back orders, but it is a consensus of opinion that new business will be in restricted compass. On the other hand, the expectation is that another period of broad buying will set in next fall or after consumers and converters have worked off stocks they have accumulated. In short, the theory is that a quiet summer—which most members of the trade regard as a healthy sign after all that has been experienced over the past few months—will be followed by a brisk autumn and early winter. Thus, while some apprehension is felt over the present situation, few within the industry appear to be seriously worried about the market's prospects.

Meantime, the price position is a factor lending assurance to the outlook. Paper manufacturers are not as yet eager enough for orders to cause them to reduce prices. Instead, the tendency of prices—wherever anything of a definite nature in this connection can be discerned—is unmistakably upward, and such readjustments as have been recorded during the last month have been practically without exception in a higher course. The price of kraft wrapping paper has been advanced $5 a ton to $90 basis, some of the fine paper lines have been moved up further in price, while book paper advances have been consolidated to a degree where virtually all manufacturers are quoting the higher levels.

Production of newsprint in Canada in May topped the previous high mark established in March last by a substantial margin, and registered a gain of 15.8 per cent over May, 1936, according to News Print Service Bureau figures. During May, 309,232 tons of newsprint were produced in Dominion mills, against a previous record total of 301,110 tons in March, and 267,067 tons in May last year. United States output was up moderately in May to 79,003 tons, compared with 75,719 tons a year ago, to bring the production for both the United States and Canada up to a new high mark at 388,235 tons. The previous top level for both countries was 383,686 tons in March this year.

During the first five months of 1937 production in both countries was 1,864,210 tons, also a record high, comparing with 1,599,521 tons in the similar period of last year. The United States produced a total of 392,298 tons of print paper in five months this year, a rise of 11,989 tons or 3.2 per cent over 380,309 tons in the same time a year ago, while Canadian output reached 1,471,912 tons, up 252,700 tons or 20.7 per cent contrasted with 1,219,212 tons in the corresponding period in 1936. Canadian shipments of newsprint in May were 311,883 tons and United States shipments were 77,797 tons. Stocks on hand at mills in both countries amounted to 82,002 tons at the end of May, compared with 83,447 tons a month before and 82,146 tons on May 31, 1936.

Publishers are stocking up on newsprint, an analysis of latest statistics by the Newsprint Association of Canada reveals. This indicates that publishers are attempting to even up purchases during the year, to avoid heavy buying in normal peak months of the year which might result in a newsprint shortage. In April, stocks of newsprint held by United States publishers rose to 325,089 tons, or 36 days' supply, as compared with 237,717 tons, or 28 days' supply, in April, 1936. In contrast with the decline in Canadian and Newfoundland overseas shipments this year, shipments to the United States from Canada were up 13.8 per cent in May and 25 per cent higher for the first five months of this year, while shipments to the United States from Newfoundland were up 20.2 per cent and for five months up 35.2 per cent.

European shipments of newsprint to the United States market, although still a relatively unimportant factor, have shown a substantial increase this year. In April, Europe supplied United States publishers with 24,560 tons, up 25.4 per cent over April last year, while for the first four months of 1937 European sales to the United States totaled 87,250 tons, a gain of 12.5 per cent over the same 1936 period. Newsprint consumption of 431 United States publishers in April showed a rise of 8.8 per cent over the similar 1936 month, and the four months' total was up 9.8 per cent over the 1936 period. Advertising in 52 American cities in April showed a gain of 2.8 per cent, and for four months the increase was 7.1 per cent.

Production of paperboard in the United States in April last totaled 418,665 net tons, contrasted with 428,506 tons in the preceding month and 295,899 tons in the similar 1936 month, making a total for the first four months of this year of 1,586,267 tons, against 1,123,473 tons in the corresponding time of last year, and 1,050,517 tons in 1935. Board mills produced at 92.8 per cent of their rated capacity during April, against 91.6 per cent in March this year and 71.8 per cent in April a year ago. New orders received by manufacturers called for a total of 404,108 tons of board in April, contrasted with 453,621 tons in the month preceding and 297,984 tons in April, 1936, while unfilled orders held by mills at the end of April were for 200,833 tons of board, against 265,575 tons a month previously and 99,796 tons at the same time a year ago.

Shipments of prepared roofing from mills in the United States during April totaled 2,423,178 squares, according to the Census Bureau's summary, comparing with 2,328,656 squares in March last and 2,743,899 squares in April last year. The total in the first four months of the current year reached 10,726,949 squares, against 9,988,982 squares in the corresponding 1936 period, and 7,013,004 squares in 1935.

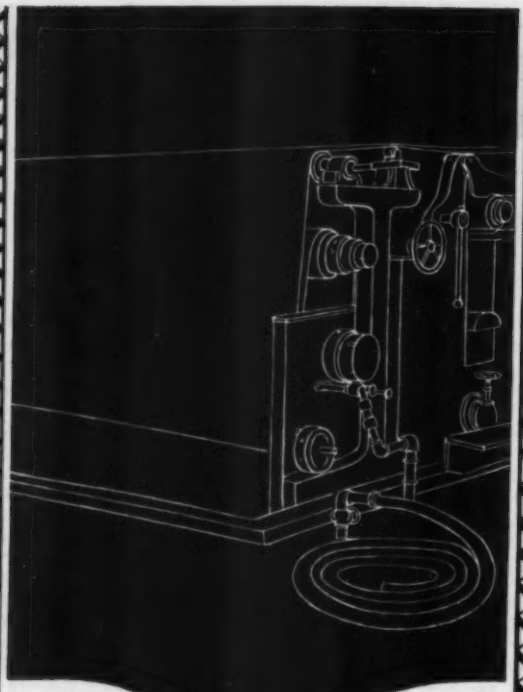
◆ ◆

◆ Forestry College Warns Against Caterpillars

A bit of warning advice regarding the ravages of the tent caterpillar has been issued recently by the New York State College of Forestry at Syracuse, N. Y., which states that the pest should be fought throughout the summer and fall and not only during the season of its prevalance.

The college has recommended the spraying of tree foliage with lead arsenate, one and one-half to two pounds to fifty gallons of water. This should be applied in the early spring when the young caterpillars just begin to feed. The cocoons follow the invasion of the caterpillars and these white, egg-shaped masses should be destroyed. Moths emerge from the cocoons and in July and August deposit eggs which may be found encircling the twigs of trees. The twigs should be pruned and the eggs destroyed or the latter will hatch in the spring.

◆ DONALD C. BAKEWELL, who recently became affiliated with the Blaw-Knox Company, has been elected a vice-president.



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Domestic RAW MATERIALS

◆ Papermaking Rags

Summer "dog days" are proverbially a quiet period for papermaking raw materials, and the present is no exception to the general rule notwithstanding the very active condition of the markets in recent months. Demand for rags for paper manufacture, along with practically all other raw stock which paper mills buy and consume, has slowed down perceptibly; as a matter of fact, at the moment there is scarcely any purchasing at all by manufacturers, most of whom are too busily engaged with mid-year inventories, machinery repairs and other such seasonal activities to have much time to devote to the acquisition of additional raw material supplies.

As would be expected with the market as quiet as it is, the price tone is easy, and the trend in price levels is altogether in favor of buyers. There is no undue pressure to sell, dealers and importers appreciating that mill customers are in no mood to buy, and therefore biding their time until consumer interest in rag stock revives. Some classes of papermaking rags, notably roofing grades, have moved sharply lower in value; others have recorded more moderate recession, whereas still others have maintained their quotable levels relatively well. The supply position appears comparatively bullis, yet this of course wages little or no influence under the dull market circumstances such as now prevail.

Dealers are putting a good deal of emphasis on the relative high prices ruling on papermaking rags in Europe as contrasted with our market levels. Not only are European shippers refusing to sell rag stock to the United States at the prices importers here feel justified in bidding at present, with the result our importations are falling off, but buyers in Europe are acquiring a good portion of their supplies from the United States. Shipments of rags from here to Europe have assumed sizable dimensions in some cases, and in view of the wide difference in prices here and abroad, it seems likely purchases by Europe in the American market may keep up if not increase.

Roofing rags are down to a price basis in the East of 1.15 cents per pound for No. 2 classification stock and 1.30 cents for No. 1 grade f.o.b. shipping points; it is possible that purchases have been made in exceptional cases even slightly under these levels. Roofing felt mills from all indications are amply supplied with rags, and are engaging in little buying, either of domestic or imported material. Foreign roofing is strictly nominal in price; importers say they are unable to purchase foreign dark colored cottons abroad at less than about 1.70 cents a pound, on a landed basis here, which grade is comparable with our No. 2 domestic roofing stock, thus showing a spread of some 55 points, or $11 per ton, between current quotations on imported and domestic roofing rags.

New No. 1 white shirt cuttings are reported available to paper mills at 8.75 cents a pound f.o.b. dealers' shipping points, if not at slightly less, while new unbleached muslins are quoted at about 9.25 cents at shippings points, light silesias at 7 cents, new blue overall cuttings at 7.50 cents, fancy shirt cuttings at 3.75 cents, bleached canton flannels at 8.50 cents, new black silesias at 4.50 cents, washables at 2.75 cents, new white linens at 12 cents and grey linens at 11.25 cents.

Old No. 1 white cottons are selling fairly freely for export and bringing 3.50 cents or higher per pound on a f.a.s. basis. Domestic paper mills are ignoring old whites and blues, and prices of the latter are nominal at about 2.25 cents for twos and blues and 2 cents for thirds and blues f.o.b. dealers' points.

◆ Chemical Pulp

New and higher prices, announced a little while back, are now in effect on domestic sulphite and soda pulps for the third quarter of the year. Bleached sulphite for July-September, inclusive, shipment on contract is 3.25 to 3.45 cents per pound, ex dock American Atlantic seaboard basis, this range of price covering the several qualities. Unbleached sulphite is 2.60 to 2.70 cents, also ex dock Atlantic seaboard, and domestic bleached soda pulp is 3.15 cents delivered book paper mills. Only contract customers can buy at these prices; such spot domestic pulp as is to be had is fetching far higher values, in line with prevailing prices of imported wood pulp. Domestic kraft pulp is 3.25 to 3.50 cents a pound f.o.b. pulp mills, to possibly higher in some cases.

◆ Chemicals

Casein quotations show greater steadiness at 13 to 14 cents per pound for domestic standard ground, and 13.50 to 14.50 cents for finely ground. Solid caustic soda is 2.55 to 2.60 cents on contract, and soda ash is firm at 1.20 to 1.30 cents in bags, f.o.b. works. Papermaking chemicals are generally steady in price.

◆ Rope and Bagging

Prices of old rope have eased to where currently quoted levels are 4.50 cents a pound f.o.b. shipping points on No. 1 domestic old manila rope, and this price to slightly higher or up to 4.75 cents ex dock American Atlantic ports on foreign old rope. There is very little demand at present, and market values seem headed for further decline. Bagging also is quiet and quotably lower. Scrap burlap for paper mills is reported available at 1.80 cents upwards at shipping points, depending on quality of the material concerned, some superior packings being held at 2 cents or more, while No. 1 gunny bagging is around 2.15 cents a pound, and roofing bagging nominally 90 cents to $1 per hundred pounds.

◆ Old Paper

As customarily is the case in the summer, waste paper prices are moving downward, and some rather sharp reductions have been registered in recent weeks. Board and other consuming mills have let down in purchasing to a marked degree, and it is very evident there is more supply offered than there are buyers to take up the available tonnage. The greater decline has occurred in low or bulky grades, the so-called high quality stocks like white shavings, envelope cuttings, krafts and ledgers maintaining their price levels relatively better.

No. 1 mixed paper is selling in the East at 35 cents per hundred pounds, and in the Middle West at 50 cents. Folded news is off to 42½ cents per hundred in the East f.o.b. shipping points, old corrugated boxes at 60 to 65 cents a hundred pounds, No. 1 books and magazines 1.10 cents per pound, white ledger stock 1.75 to 1.85 cents, colored ledgers 1.60 cents, No. 1 old kraft 1.65 to 1.75 cents, No. 1 soft white shavings 2.30 cents upwards for ordinary and 2.70 cents for one-cut packing, No. 1 hard white shavings on a range of 2.60 to 3 cents, and No. 1 hard white envelope cuttings 3 to 3.10 cents.

◆ Mechanical Pulp

While demand for mechanical wood pulp has simmered down, there are no signs of any surplus tonnage pressing for sale, and a distinctly firm undertone characterizes quoted prices. Domestic and Canadian prime moist freshly-ground mechanical pulp is selling at $37.50 per ton delivered at consuming centers in northern United States. This is the basis quoted by producers and they are adhering steadfastly to this price, which incidentally is sufficiently below the price level named on Scandinavian groundwood to cause consumers to look to fill their current needs with domestic and Canadian wood. Plentiful water has enabled grinders to operate freely thus far this year, but there is expectation within the trade that later on low water may oblige consumers to enter the open market for substantially larger amounts of groundwood.

◆ Pulpwood

Pulpwood is in steady demand, with a large movement against contracts and manufacturers seeking additional spot supplies. Prices are firm and exhibiting an upward tendency, although having scored no further advancement.

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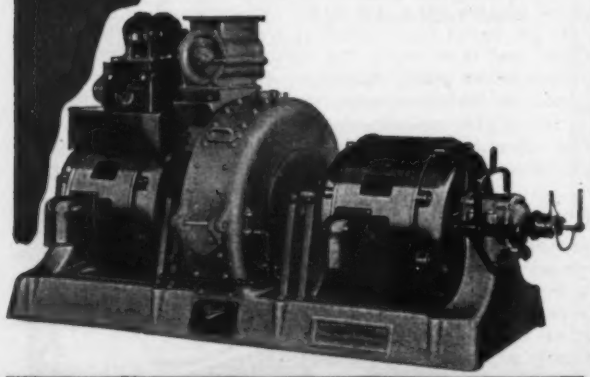

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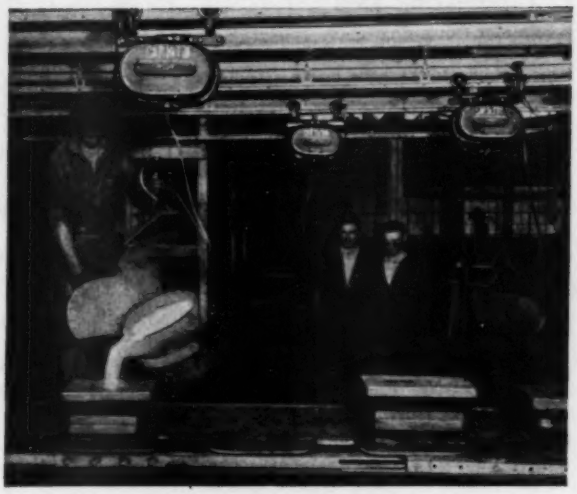

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

Three major reasons seem responsible for a decidedly quieter demand for imported wood pulp. The first is heavier arrivals from primary sources abroad over recent weeks, representing first open water shipments from the East Coast of Sweden following the opening up of the Baltic after the winter freeze. The second is the slowing down of paper and board mill operations with the advent of the summer period, and a consequent contraction of requirements, and the third the stiff quotations named from Europe on pulp and the indisposition of producers on the other side of the Atlantic to digress one whit from the comparatively high prices asked.

That the market is much slower, there is absolutely no doubt. However, little or no apprehension is expressed, or apparently felt, within the trade over this. As a matter of fact, most sellers of pulp have limited tonnage to offer, for shipment from abroad currently, during the remainder of this year, or throughout all of 1938. Sales of both sulphite and kraft pulps have been in such large volume that producing mills are in most instances completely sold up for the next twelve to eighteen months, and they are not keen about committing themselves farther ahead.

However, with needs relieved to some extent owing to the seasonal slowness of the paper market, with fair-sized supplies on hand as an outcome of larger arrivals from Europe recently and with additional big tonnages on order for future delivery, paper manufacturers are not nearly so eager to buy as they were up to lately, and trade in pulp has narrowed substantially. At the same time, while the strong forward movement in prices seems unquestionably halted, for at least the present, and while it appears possible specific lots of pulp may be had at what might be called a slight price recession, there has been no general easing of price levels.

Quotations on prime bleached sulphite for shipment from abroad any time in the near future range from 4.50 cents to 5 cents a pound, ex dock American Atlantic ports. It is reported that some producers in Europe want 5.25 cents for bleached sulphite, though it hardly seems likely buyers here have paid this price thus far. Prime strong unbleached sulphite is quoted 3.50 to 3.75 cents landed at American ports, and sales have been made at these prices. Prime easy bleaching sulphite is 3.75 cents or thereabouts up to 4 cents. Kraft pulp, which is said to be almost fully outsold for next year with practically no tonnage at all left for this year, is nominally 3.50 to 3.75 cents a pound for the current year and 3 to 3.15 cents for 1938 shipment. Spot lots of kraft are up around 3.75 cents a pound, ex dock basis, if found available. Scandinavian groundwood is priced at $40 and higher per short ton for dry pulp for current shipment, ex dock American Atlantic seaboard.

As is seasonally the case, imports of wood pulp into the United States declined during April compared with the several previous months, due to closed navigation over the Baltic. A total of 108,625 short tons of 2,000 pounds of chemical pulp, air dry weight, valued at $5,114,937 was imported in April, according to U. S. Department of Commerce figures, against 151,839 tons valued at $6,529,732 in March last, and 108,982 short tons of a value of $4,500,996 in April, 1936.

The April importations brought the total for the first four months of this year up to 642,313 short tons of chemical grades, representing a substantial increase over 571,623 tons in the corresponding 1936 period. Groundwood imports in April amounted to 19,669 short tons of a value of $363,712, compared with 15,443 tons valued at $297,026 in the month preceding and 12,415 tons of a value of $227,861 in the same month last year.

◆ Paper Stock

Imports of all paper base stocks, including pulpwood and wood pulp, into the United States in April last underwent a decline of 17 per cent in aggregate value compared with March this year, but were 18 per cent above the April, 1936, receipts, the Department of Commerce reports. With the exception of mechanical pulp and waste for papermaking, all classes in the group failed to attain the level of the March, 1937, receipts. Imports of unbleached sulphate pulp dropped off by 25½ per cent contrasted with a year ago. The losses were more than offset, however, by gains of 61 per cent in bleached sulphite, 5 per cent in unbleached sulphite and 49 per cent in waste stock other than rags. Receipts of paper base stocks in April, 1937, reached an aggregate value of $6,621,199. Of this total, wood pulp accounted for $5,472,761, pulpwood $229,202, and rags and other waste $919,236.

Imports of papermaking rags were 31,108,692 pounds, valued at $532,097, in April last, making a total for the first four months of this year of 103,397,119 pounds of a value of $1,916,946, against 97,757,875 pounds of a value of $1,448,323 in the first four months of 1936, while other paper stock imports were 14,465,110 pounds valued at $381,251 in April last, making a total of 45,708,835 pounds valued at $984,080 in four months, against 38,836,346 pounds valued at $624,322 in the same 1936 period.

◆ Paper

Imports of paper and paper products during April declined slightly compared with March, while exceeding April, 1936, receipts by 33 per cent. Total imports were valued at $10,991,085, against $11,246,870 in March and $8,188,893 in April a year ago. April imports of standard newsprint reached 263,620 short tons, a decline of 2½ per cent from the preceding month but a rise of 30 per cent over the corresponding month last year.

EXPORTS

Exports of paper and paper products from the United States during April showed a total value of $2,541,910, against $2,797,047 in the month preceding and $1,855,347 in April, 1936. For the first four months of the current year shipments were valued at $9,341,236, contrasted with $7,274,678 for the similar period of 1936.

The decline in April from the preceding month was not unusual for this time of the year, and it is noteworthy that April shipments surpassed those of the same month last year by 37 per cent. This increase, of course, is due in part to the higher average unit value of exports this year, but it is likewise due to an increase in the volume of a majority of the items. Among those in which exports more than doubled during April as compared with a year ago were book papers, 180 per cent; old newspapers, 103 per cent; towels and napkins, 128 per cent; sheathing and building papers, 145 per cent; writing paper, 116 per cent, and cover paper, 105 per cent. Heavy increases in the volume of shipments were also registered in greaseproof and waterproof papers, 40 per cent; surface coated papers, 22½ per cent; toilet paper, 22 per cent; miscellaneous paperboards, 48 per cent; wallboard, 26 per cent; paper hangings, 51 per cent; paper bags, 72 per cent; envelopes, 40 per cent, and vulcanized fibre, 61 per cent. Exports of newsprint were 17½ per cent greater than in March, but were 45 per cent under April, 1936.

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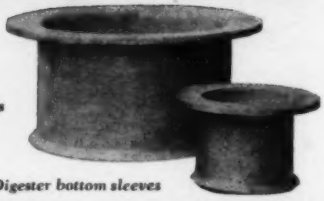

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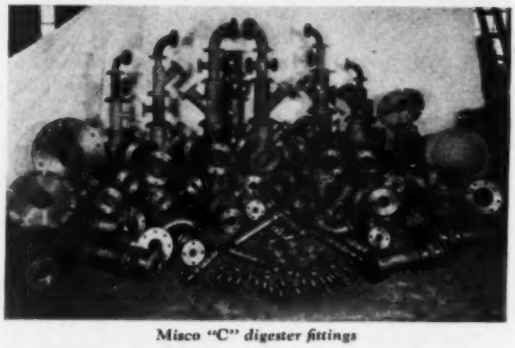

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